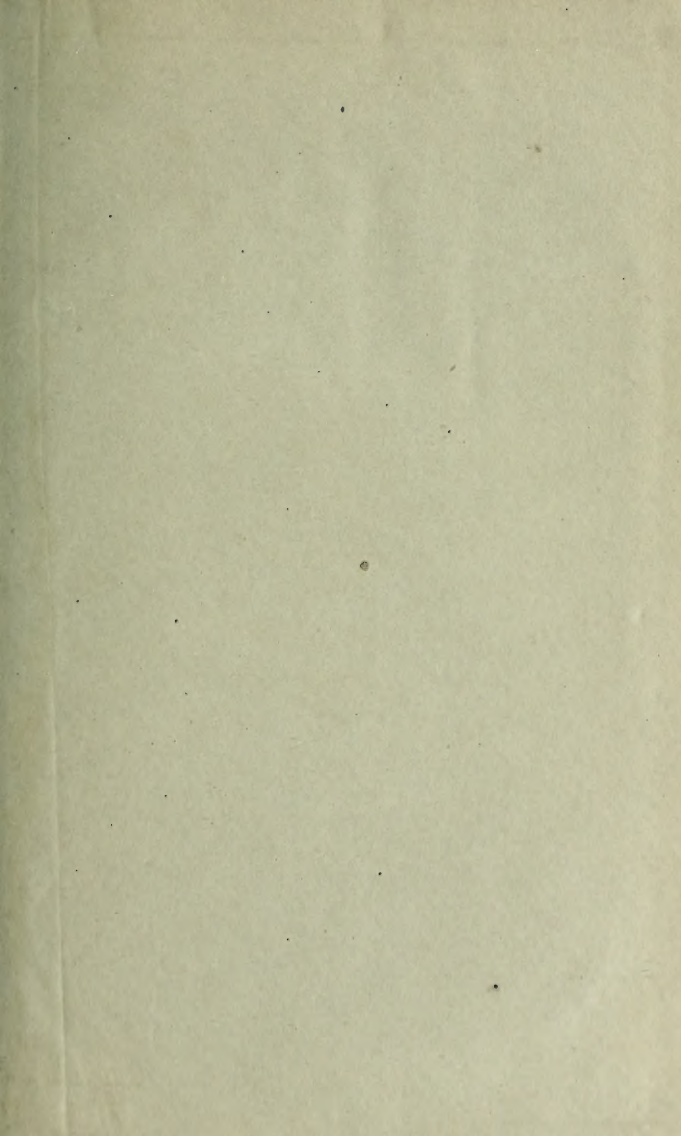



610.5

G46
n.57

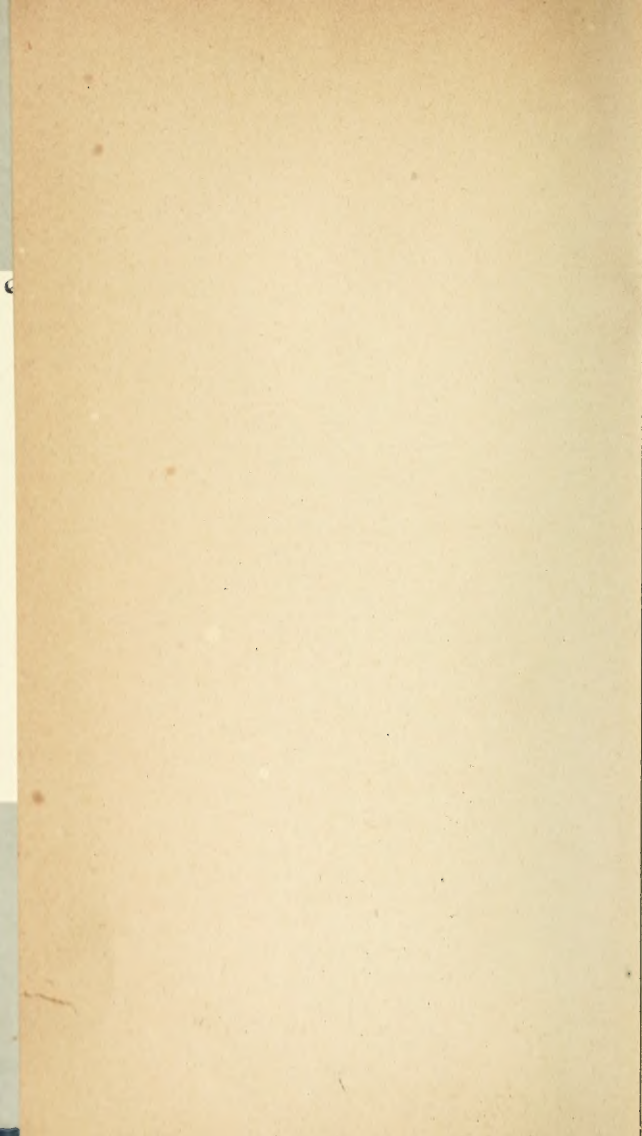


Library
of the
Academy of Medicine,
Toronto.
8087





Digitized by the Internet Archive
in 2010 with funding from
University of Toronto



THE
GLASGOW
MEDICAL JOURNAL

(PUBLISHED QUARTERLY),

EDITED BY A COMMITTEE

OF THE

GLASGOW & WEST OF SCOTLAND MEDICAL ASSOCIATION.

VOL. VII., NEW SERIES.

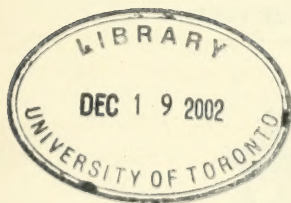


GLASGOW:
DUNN & WRIGHT, 47 WEST NILE STREET.

1875.

8087.

GLASGOW:
DUNN AND WRIGHT,
PRINTERS.



LIST OF CONTRIBUTORS OF ORIGINAL ARTICLES.

- AIKMAN, JOHN, M.D., Guernsey, formerly Assistant Medical Officer, Hampstead Smallpox Hospital, London.
- ANDERSON, T. M'CALL, M.D., Professor of Clinical Medicine in the University of Glasgow.
- BARR, THOMAS, M.D., Glasgow.
- BUCHANAN, GEORGE, M.A., M.D., Professor of Clinical Surgery in the University of Glasgow.
- CASSELLS, JAMES PATTERSON, M.D., M.R.C.S.E., Surgeon to the Glasgow Dispensary for Diseases of the Ear.
- COATS, JOSEPH, M.D., Lecturer on Pathology in Glasgow University.
- DOUGALL, JOHN, M.D., Glasgow.
- FINLAYSON, JAMES, M.D., Physician to Glasgow Western Infirmary.
- FLEMING, WILLIAM J., M.B., F.F.P.S.G., Surgeon to the Dispensary of the Western Infirmary, Glasgow.
- FOULIS, DAVID, M.D., Pathologist to the Glasgow Royal Infirmary.
- GAIRDNER, W. T., M.D., Professor of Practice of Medicine, University of Glasgow.
- GEMMELL, SAMSON, M.B., Medical Superintendent City of Glasgow Smallpox Hospital.
- KNOX, D. N., M.A., M.B., Demonstrator of Anatomy in the University of Glasgow.
- LECKIE, DAVID, M.B., C.M., Staff Surgeon H. M. British Army, India.
- MACCALL, W. M., M.D., Assistant Medical Officer to Clinical Hospital, and Dispensary for Diseases of Women and Children, Manchester.

M'EWEN, WILLIAM, M.D., Casualty Surgeon, Glasgow, Surgeon to Glasgow Royal Infirmary Dispensary.

M'FARLANE, JAMES, Assistant to Professor of Chemistry, St Andrews University.

M'LAREN, J. D., M.D., Physician to the Royal Infirmary, Glasgow.

NAIRNE, ALEX., L.R.C.P.E., Glasgow.

NAIRNE, J. S., L.F.P.S., Glasgow.

OGSTON, ALEXANDER, M.D., Aberdeen.

RENTON, J. C., M.B., Glasgow.

ROBERTSON, ALEX., M.D., Physician to Town's Hospital and Asylum, Glasgow.

SIM, J. BROWN, M.B., Nottingham.

SNEDDON, WILLIAM, M.D., Beith.

THOMAS, MOSES, M.D., Medical Superintendent Glasgow Royal Infirmary.

WILL, J. C. OGILVIE, M.D., Assistant Surgeon Aberdeen Royal Infirmary.

WRIGHT, STRETHILL H., M.D., M.R.C.P.E., Physician to Barnhill Hospital and Asylum, Glasgow.

INDEX.

A		C	
	Page		Page
Abscess of the Brain. By Dr J. D. McLAREN, - - - - -	112	CARTER, R. BRUDENELL—Treatise on Diseases of the Eye (<i>Review</i>), - - -	530
AITKEN, Dr WILLIAM—Outlines of the Science and Practice of Medicine (<i>Review</i>), - - - - -	87	CASSELLS, Dr JAS. P.—On Ear Parasites, Chemistry, Physiological, Demonstrations on. By S. W. MOORE (<i>Review</i>), -	85
AIKMAN, Dr JOHN—A Study of 200 Cases of Re-Vaccination, - - -	160	Chickenpox—Record of an Epidemic of Chickenpox. By SAMSON GEMMELL, M.B., - - - - -	412
Amputations—Results of, in Glasgow Royal Infirmary for 25 years. By Dr M. THOMAS, - - - - -	208	Chloral Hydrate—Operation under. By J. S. and ALEX. NAIRNE, - - -	355
Amyl, Nitrite of, in Epilepsy, - - -	562	Cholera—How to prevent and resist it. By Dr MAX VON PETTENKOFER (<i>Review</i>), - - - - -	375
ANDERSON, Dr J. W.—The Etiology of Hysteria (Med. Chir. Soc.), - - -	278	Chorea, Esserine in, - - - - -	563
ANDERSON, Dr M'CALL—A practical treatise upon Eczema (<i>Review</i>), -	98	CHURCHILL, Dr JOHN F.—Consumption and Tuberculosis (<i>Review</i>), - - -	375
" Lectures on Clinical Medicine—1. Case of Hysteria, - - - - -	193	Circulation of the Blood, the Forces which carry on. By Professor ANDREW BUCHANAN (<i>Review</i>), - -	245
Aneurism, Thoracic, Cases of.—By Dr W. T. GAIRDNER, - - - - -	22	Clinical Lectures and Essays. By Sir JAMES PAGET, Bart. (<i>Review</i>), - -	529
Aneurism, internal—The successful treatment of. By JOLLIFFE TUNNELL, F.R.C.S. (<i>Review</i>), - - -	518	COATS, Dr JOSEPH—Abstracts of Exchange Journals (see Exchange Journals), - - - - -	
Anthraxosis—Miners' Anthracosis. By Dr WM. SNEDDON, - - - - -	418	" On the Redness and Swelling of Inflammation, as related to the condition of the Blood and Blood-Vessels. (Med. Chir. Soc.), - - -	274
Antiseptic treatment of penetrating wounds of Thorax and Abdomen. By Dr WM. MEWEN, - - - - -	1	" Results of some Injections of Kidneys in Bright's Disease, -	453
Arsenical wall papers. By JAMES MACFARLANE, - - - - -	10	Consumption and Tuberculosis. By JOHN F. CHURCHILL, M.D. (<i>Review</i>), -	575
ATTHILL, LOMBE, M. D.—Clinical Lectures on Diseases Peculiar to Women (<i>Review</i>), - - - - -	375	Corpus Callosum, defective (<i>with plate</i>). By D. N. KNOX, M.B., - - - - -	227
Atropine in Opium poisoning, - - -	562		
B		D	
BARR, THOMAS, M.D.—Notes on Pneumonia, - - - - -	314	Dental Pathology and Surgery. By S. JAMES A. SALTER, M.B. (<i>Review</i>), -	248
BASTIAN, Dr H. C.—On Paralysis from Brain Disease in its common forms (<i>Review</i>), - - - - -	523	DICKINSON, Dr W. HOWSHIP—Diseases of the Kidney and Urinary derangements (<i>Review</i>), - - - - -	367
Birds, the Shoulder-Girdle of. By D. N. KNOX, M.E., - - - - -	487	Diphtheritic Sore Throat, - - - - -	141
Blood—Forces which carry on Circulation of. By Professor ANDREW BUCHANAN (<i>Review</i>), - - - - -	245	Domestic Sanitation. By Dr FERGUS (Med. Chir. Soc.), - - - - -	552
Blood and Blood Vessels—Inflammation as related to. By Dr JOSEPH COATS (Med. Chir. Soc.), - - - - -	274	DOUGALL, Dr JOHN—On the Prevention of Putrefaction, and the Destruction of Contagia, - - - - -	313
Books, Pamphlets, &c., received, - -	288, 565		
Brain—Abscess of. By Dr J. D. McLAREN, - - - - -	112	E	
British Pharmacopoeia—Commentary on. By Dr WALTER G. SMITH (<i>Review</i>), - - - - -	528	Ear—Atlas of Diseases of Membrana Tympani (<i>Review</i>), - - - - -	88
BUCHANAN, Prof. ANDREW—The Forces which carry on the Circulation of the Blood (<i>Review</i>), - - - - -	245	Ear—Haematomata Auris. By Dr ALLEN ROBERTSON, - - - - -	308
BUCHANAN, Dr GEORGE—Clinical Surgical Report for 1874, - - - - -	326	Ear Parasites. By Dr JAMES P. CASSELLS, - - - - -	31
" Surgical Practice in Western Infirmary from 1st Nov., 1874, to 1st May, 1875, - - - - -	375	" (Med. Chir. Soc.), - - - - -	145
		Ear—The Questions of Aural Surgery. By JAMES HINTON (<i>Review</i>), - - -	88
		Eczema, Practical Treatise on. By Dr M'CALL ANDERSON (<i>Review</i>), - - -	98

[illegible]

	Page		Page
M'VAIL, D. C.—On the Mechanism of the Movements of the Ribs and Sternum, in respiration (Med. Chir. Soc.), - - - - -		Pathological Anatomy of the Nervous Centres. By Dr EDWARD LONG FOX (<i>Review</i>), - - - - -	83
Medicine, Outlines of. By Dr WILLIAM AITKEN (<i>Review</i>), - - - - -	295	Pathological Record. By Dr DAVID FORLIS, PAGET, Sir JAMES—Clinical Lectures and Essays (<i>Review</i>), - - - - -	470
MEDICO-CHIRURGICAL SOCIETY—Session, 1874-75.	87	Peritonitis, Cases of, associated with Cardiac and Renal Disease. By Dr HINLAYSON, - - - - -	529
Second Meeting—Dr WM. McEWEN: Penetrating Wounds of the Throat and Abdomen, - - - - -		PETTENKOFER, Dr MAX VON—On Cholera (<i>Review</i>), - - - - -	479
Third Meeting—Dr CASSIDY: Parasitic Diseases of the Ear, - - - - -	115	Phthisis, Cough and Sweating in, - - - - -	375
Fourth Meeting—Dr JOSEPH COATS: On the Redness and Swelling of Inflammation as related to the condition of the Blood and Blood-Vessels, - - - - -	118	Physiological Chemistry, Demonstrations on. By S. W. MOORE (<i>Review</i>), - - - - -	155
Fifth Meeting—Dr JAMES W. ANDERSON: The Etiology of Hysteria, - - - - -		Pleuritic Effusion. By Dr D. FOULIS, - - - - -	85
Sixth Meeting—Mr D. C. M'VAIL: On the Mechanism of the Movements of the Ribs and Sternum in Respiration, - - - - -	274	Pneumonia, Notes on. By Dr THOMAS BARR, - - - - -	341
Seventh Meeting—Dr M. THOMAS: On the results of Amputation in the Royal Infirmary for 25 years, - - - - -	278	Prescribing, Lessons on. By Dr W. H. GRIFFITH (<i>Review</i>), - - - - -	529
Eighth Meeting—Dr JOHN DOUGALL: On the Prevention of Putrefaction and the Destruction of Contagia, - - - - -	395	PURDON, Dr H. S.—Diseases of the Skin, (<i>Review</i>), - - - - -	556
Ninth Meeting—Dr M'LAUREN: Case of Empyema treated by Paracentesis Thoracis, - - - - -		Putrefaction and Contagia, On Prevention of. By Dr JOHN DOUGALL, - - - - -	311
Tenth Meeting—15th June, 1875, - - - - -			
First Meeting—Domestic Sanitation. By Dr FERGUS, - - - - -		R	
Milk—Typhoid Epidemic, apparently arising from Infected Milk. By Dr ALEX. OGSTON, - - - - -	280	RENTON, J. C., M.B.—Therapeutic Note by, - - - - -	518
MILTON, J. L.—On Spermatorrhoea (<i>Review</i>), - - - - -	371	Respiration—On the Mechanism of the Movements of the Ribs and Sternum in Respiration. By Mr D. C. M'VAIL. (Med. Chir. Soc.), - - - - -	395
MONOD, Dr CHARLES—Etude sur l'Angiome, &c. (<i>Review</i>), - - - - -	242	Resection of Sternum and Ribs, - - - - -	561
MOORE, S. W.—Demonstrations on Physiological Chemistry (<i>Review</i>), - - - - -	85	ROBERTSON, Dr ALEXANDER—Case of Epileptic Homicidal Impulse, - - - - -	48
MORGAN, NICHOLAS—The Skull and Brain: their Indications of Character and Anatomical Relations (<i>Review</i>), - - - - -	590	" Hematoma Arteris - - - - -	368
MURCHISON, Dr CHAS.—On the Functional Derangements of the Liver (<i>Review</i>), - - - - -	129	" On the Unilateral Phenomena of Nervous and Mental Disorders, - - - - -	496
MURRAY, JOHN, M.A., M.D.—Obituary, - - - - -			
		S	
N		St George's Hospital Reports (<i>Review</i>), - - - - -	369
NAIRNE, J. S., and NAIRNE, ALEX.—Operation under Chloral Hydrate, - - - - -	355	Savine—Case of Poisoning with Oil of Savine. By J. BROWN SM, M.B., - - - - -	516
NAYLOR—Etude sur l'Angiome Simple Sans Containe Circonscrit, &c. Par le Dr CHARLES MONOD (<i>Review</i>), - - - - -	242	SALTER, S. JAMES, A., M.B.—Dental Pathology and Surgery (<i>Review</i>), - - - - -	248
Nervous Centre, Pathological Anatomy of. By Dr EDWARD LONG FOX (<i>Review</i>), - - - - -	80	Sanitation, Domestic. By Dr FERGUS (Med. Chir. Soc.), - - - - -	552
Nervous System, Dr Seguin on, - - - - -	136	Sex in occupation, - - - - -	169
Nitrite of Amyl in Epilepsy, - - - - -	562	Shoulder-Girdle of Birds. By D. N. KNOX, M.B., - - - - -	487
Nursing, Account of Dresden Nursing Association. By W. J. FLEMING, M.B., - - - - -	229	SIM, J. BROWN, M.B.—Case of Poisoning by Oil of Savine, - - - - -	516
		Skin Diseases of. By H. S. PURDON, M.D. (<i>Review</i>), - - - - -	550
O		Skin Diseases—Notes on Treatment. By ROBERT LUTHER, M.A., M.D. (<i>Review</i>), - - - - -	520
OGSTON, Dr ALEX.—A Typhoid Epidemic, apparently arising from Infected Milk, Ophthalmic Congress, - - - - -	561	Skull and Brain—their Indications of Character and Anatomical Relations. By NICHOLAS MORGAN (<i>Review</i>), - - - - -	590
Opium poisoning, Atropine in, - - - - -	562	Spermatorrhoea. By J. L. MILTON (<i>Review</i>), - - - - -	371
		SNEEDON, WM., M.D.—Muer's Anthracosis, - - - - -	113
P		Sternum and Ribs, Resection of, - - - - -	561
Paralysis from common forms of Brain Disease. By Dr H. C. BASTIAN (<i>Review</i>), - - - - -	525	Sulcalian Artery and Vein, Wounds of. By Dr J. C. O. WILK, - - - - -	171
		T	
		Tapeworms—Pinus on the Treatment of, - - - - -	188
		Temperature in Debarrescence. By Dr JAMES HINLAYSON, - - - - -	115
		THOMAS, Dr M.—Results of Amputation in Glasgow Royal Infirmary for 25 years, - - - - -	200
		Thoracic Aneurism, &c. Cases of. By Dr W. T. GALLAGHER, - - - - -	32

	Page
Thorax and Abdomen -- Penetrating Wounds of--Treated Antiseptically.	
Dr WILLIAM McEWEN, - - -	115
" (Med. Chir. Soc.), - - -	562
Tongue, Black Colouration of,	48
Tourniquet and Laryngoscope -- Adaptations of. By Dr D. FOLLIOT, - - -	291
Tubercle -- A Study of. By Dr DAVID FOLLIOT (<i>with plates</i>), - - -	513
TUFFELL JOLLIFFE -- The Successful Treatment of Internal Aneurism (<i>Revue</i>),	352
Typoid Epidemic, apparently arising from Infected Milk. By Dr ALEX. OGSTON, - - -	
U	
Unilateral Phenomena of Nervous and Mental Disorders. By Dr ALFRED ROBERTSON, - - -	496

V		Page
Vaccination—A Study of 200 Cases of Re-		
Vaccination. By Dr JOHN ALKMAN,		
Veterinary Journal and Annals of Com-		
parative Pathology (<i>Review</i>), - -		528
W		
WALFORD, CORNELIUS—Insurance Cyclo-		
pædia (<i>Review</i>), - - - - -		71
WALTON, HAYNES—A Practical Treatise		
on the Diseases of the Eye (<i>Review</i>), -		360
WILL, Dr J. C. OGILVIE—Wound of Left		
Subclavian Artery and Vein, &c., -		173
Women—Clinical Lectures on Diseases		
peculiar to Women. By LOMBE		
ATTHILL, M.D. (<i>Review</i>), - - -		375
WRIGHT, Dr STRETHILL II.—Story of an		
Insane Life, - - - - -		175

THE
GLASGOW MEDICAL JOURNAL.

January, 1875.

Original Articles.

I.—PENETRATING WOUNDS OF THORAX AND ABDOMEN TREATED
ANTISEPTICALLY.

By WILLIAM MACEWEN, M.D., F.F.P.S.G., *Casualty Surgeon, Glasgow ;
Surgeon to Glasgow Royal Infirmary Dispensary.*

I.—Penetrating Wound of the Lung.

J. W., 12 years of age, came under observation on 11th October, 1873, stating that he had received a violent blow on the back half-an-hour previously.

A wound was found on the right and posterior part of the chest, between the fifth and sixth ribs, three inches from the spine. It was half an inch in length externally, and though it was very carefully explored the probe did not penetrate at first further than the subcutaneous cellular tissue. It presented altogether a very trivial aspect. The probe was withdrawn, and while he was being interrogated as to the cause of the injury he several times gasped and suddenly caught his breath, at the same time stating that there was *a something pulling at his throat*. The sudden suspension of the breathing resembled the symptom so often exhibited when a spiculum of a fractured rib irritates the lung, or like the pleuritic stitch in a more aggravated form; but the feeling of the pulling at the throat

was unusual. The ribs were very carefully examined, but no fracture could be detected; and as the symptoms continued, and there was no other cause to which it could be attributed, the solution was sought for in the wound. The wound was accordingly very carefully explored, the patient being placed in many different positions to facilitate the entrance of the probe into any further incision that might be found. Fully a quarter of an hour was spent without any result, when suddenly, while the lad assumed a stooping attitude, the probe slipped through a slit in the muscles, entered the pleural cavity, and glided against the smooth surface of the pleura. As the probe entered the cavity it was accompanied by a rush of air occasioning a whistling sound. But this clearly defined wound was not considered in itself sufficient to account for the peculiar symptom which he continued to exhibit during the examination. Careful search was therefore made for the purpose of detecting the presence of any foreign substance which might have given rise to the irritation. The probe was made to move slowly and lightly, and after some time it seemed to enter what appeared to be an irregularity or wound in the lung, as the spongy semi-elastic lung-tissue was felt instead of the smooth surface of the pleural covering, along which it had previously glided. Next, imbedded in the lung, a hard substance was detected, some portions of tissue intervening between it and the probe. By a little manipulation it came directly in contact with a something solid having a rough surface, but it was impossible to determine whether it was metal or earthenware. The outer border alone could be felt, and it seemed to be about half-an-inch in length, and not more than one-eighth of an inch in thickness, but on introducing a long handled aneurism needle it was found to extend into the lung, and to have smooth sides. The external wound was therefore enlarged, so as to admit a pair of narrow bladed forceps, which with considerable difficulty reached, seized, and withdrew the substance, which then proved to be part of the large blade of a pocket knife, over an inch in length, half an inch in breadth, and about an

eighth of an inch in thickness at the back part. It had a flower engraved on the steel, and a notch at the fractured extremity.

A pocket knife was found on a man who was apprehended on suspicion, which had one of its blades broken, a notch at the fractured extremity, and a flower engraved on the steel, all corresponding exactly with the portion of steel taken out of the lung.

There was no blood on the knife, none on the broken portion of the blade, and the break was recent.

The notched portion, which was wanting, was found firmly imbedded in the lower surface of the fifth rib. During the removal of the blade from the lung, the patient complained much of the "dragging at his throat," but as soon as it was out, this symptom disappeared entirely. After the withdrawal of the blade, profuse hæmoptysis occurred and continued for a considerable time. When it had ceased the wound was injected with a watery solution of carbolic acid, the edges brought together by sutures, and antiseptic gauze applied. The right side of the chest was then tightly fixed by means of adhesive plaster to prevent motion, and exclude as far as possible the air, although it might not produce decomposition if thoroughly filtered through the minute vesicles of the lung. One half of the lead and opium pill of the B.P. was administered and he was instructed to be kept in the recumbent position.

On 12th October, nearly twenty-four hours after having been dressed, he was found to have slept well during the night, to have had no hæmoptysis and no pain. Pulse 96, strong and good.

On the following day, forty-eight hours after having been dressed, the wound was exposed and appeared to be healed externally. The dressings were, however, carefully renewed.

On the 17th October, five days after the injury, the external wound still continued quite healed. He wanted to rise as he was tired in bed. He, however, was not allowed to get up.

On 30th October he was quite well and going about. There was no recurrence of the hæmoptysis.

The peculiar *catching at the throat* which he complained of may possibly have arisen from some of the rough portions of the fractured surface of the blade catching, during the expansion of the lungs, on the thoracic layer of the pleura, and in thus preventing the free expansion of the lung, cause a dragging feeling of the whole lung and trachea to be felt; but it may be referred much more probably to reflex action. I am not aware that this symptom has been previously noticed, and if the above be the explanation, it would only happen in very exceptional cases.

II.—Wound Penetrating the Anterior Mediastinum.

The next case is that of a strong healthy man, named T. McG., about 46 years of age, who came under observation in October, 1872. A gash was found on the left side of the breast, situated obliquely between the third and fourth ribs, the inner edge being nearly two inches from the sternum. It was two and a half inches in length externally, and penetrated the tissues in an oblique direction downwards and toward the middle line. The finger on being introduced passed easily into the wound till voluntarily arrested, when the muscular walls of the heart were felt under some soft intervening membrane, probably the thin edge of the lung. The wound seemed to have penetrated into the anterior mediastinum. The heart though thus exposed was not touched, and the lung, as far as could be ascertained, had also escaped. The hæmorrhage was slight, considering the severity of the wound, there was no hæmoptysis, and the patient only complained of a feeling of oppression over the left side of the chest. The wound was injected with a watery solution of carbolic acid (1 to 40), sutures passed but not tightened until the bleeding had entirely ceased, after which they were drawn together and antiseptic dressings applied. The lung was tightly fixed by adhesive plaster and a bandage. A half grain morphia suppository was given and he was instructed to lie quietly in bed.

Next day the dressings were soaked with sanguineous discharge. He had slept well, but still complained of the feeling of oppression on his left chest. Pulse 76, good and regular; skin cool.

On the third day from the injury there was still a considerable amount of discharge, but of a lighter colour, more serous than bloody. No inflammatory symptoms. He had rested well during the night, and did not feel in any way feverish. Pulse 68, steady and regular.

On the sixth day after the injury there was a little serous discharge on the dressings, and the wound was all but healed. He was well, and wanted up.

On the ninth day the wound was healed, and he was otherwise well. The oppression of the left side of the chest seemed entirely removed. He was, however, kept at rest for another week, after which he was allowed to go about. The heart sounds were slightly duller than usual over the middle of the sternum; otherwise all seemed right. He made a complete recovery, and not long after went back to his work.

Remarks.—It will be seen from the foregoing that the examination of these wounds has been conducted in a different manner from that which is generally described in surgical works. Bryant, for example, in speaking of thoracic wounds, directs attention to the kind of instrument with which they are inflicted, and believes that information regarding them should be derived solely from this source. How often is it possible to see the instrument which produced the wound? He goes on to say—"In the majority of cases the diagnosis is very uncertain, for there is no definite individual symptoms by which injury to the lung is to be diagnosed. The surgeon, in his anxiety to make out this point, must never be induced to examine the case too closely—that is, he must on no account be tempted to probe the wound, or to explore it with a finger; indeed, he should throw aside all direct or manipulative modes of investigation, and trust to the indirect or reasonable, for all other modes are unwarrantable." That trust should be put in the "reason-

able" method of investigation is correct, but the question is, whether the direct or the indirect method is the more reasonable. Of the two wounds under notice at present, the latter was freely explored with the finger, the former with the probe. By these examinations a tolerably accurate knowledge of the extent of the injury was gained in the latter case, while in the former one source of fatality was removed. Neither case was attended by the slightest injurious consequence, and when the fatality of such injuries is contemplated—of 147 penetrating wounds of the chest, occurring during the Crimean War in the British army, 120 died, and of 200 occurring in the Russian army before Sebastopol, and treated at Simpheropol, only 3 recovered—it may be submitted for consideration how far the antiseptic treatment may be credited with the result. If, without complicating the original injury, an investigation is enabled to be made into the nature of such wounds, and an intelligent treatment thereby adopted instead of groping in the dark, an advance in surgery has been made.

III.—Penetrating Abdominal Wound with partial Protrusion of a Fold of Bowel.

On 4th May, 1872, Ed. B., aged 17 years, was stabbed on the left side of the abdomen, about two inches above the anterior superior spine of the ilium. The opening, which was about two inches in length externally, penetrated the entire thickness of the abdominal wall, and a knuckle of bowel was held within the lips of the wound. As far as could be discovered the intestine was uninjured, but a continual oozing of blood emanated from the external opening, after the hæmorrhage from the lips of the wound had ceased; it was not, however, considered necessary to open the wound for its arrest. It was rendered antiseptic by injecting a quantity of the watery solution of carbolic acid (1 to 40). After an hour had elapsed and the oozing still continuing, sutures were passed but not tightened, the wound was dressed antiseptically, special arrangements being made on account of the bleeding, and the patient went quietly to bed. A lead and opium pill of the

B.P. was administered, to be repeated every four hours. Pulse at the conclusion of the dressing 100, weak and irregular. Eight hours afterwards the dressings were found to have absorbed a considerable quantity of blood, and coagulated blood lay over the mouth of the wound. There was no dulness on percussion over the abdomen. Pulse 96, weak but regular. Skin cool. The dressings were renewed and the lead and opium continued. Sixteen hours after the injury the dressings were stained with blood, but the hæmorrhage had practically ceased. No abnormal abdominal dulness. Pulse 86, regular and stronger. The stitches were now tightened so as to bring the lips of the wound closely together. As the patient was fully under the influence of opium the pills were stopped.

On the 5th, twenty-four hours after the injury, the dressings were stained with blood. The abdomen was slightly swollen and tender. No accumulation of blood could be detected. Pulse 82 and stronger. Skin cool and moist. Physiological effects of opium still exhibited. No motion from bowels. Milk was the sole article of diet.

6th May, pulse 88, more fretful, slight tympanitis, pain in speaking, and a twisting feeling at the navel. Vomiting had occurred. Only serous stains on the gauze. Effects of the opium had passed off, one half of the lead and opium pill was administered. No motion from bowels.

On the 7th May he was much better, the pain and the tympanitis had subsided considerably. The wound seemed closed, though, from the amount of inspissated serum on the surface, this could not be definitely ascertained. No motion.

On the 9th May the wound was healed externally. No pain, no abdominal distension, no motion.

On 14th May he had a motion, which was very dark coloured.

Next day he felt greatly better and wanted up. He was kept in the recumbent position for three weeks. After which he was permitted to go about, and soon commenced work.

In July, 1874, he was again seen and found to be quite well, never having suffered in any way since.

IV.—Penetrating Abdominal Intestinal Wound.

W. P., aged 28, was seen on 1st January, 1873, suffering from several wounds which he had received about an hour previously. The abdominal wall was divided for nearly three inches in an obliquely perpendicular direction at a point midway between the anterior superior spine of the ilium and the false ribs. Blood and a *dark grumous fluid* escaped. The finger, which was easily admitted, did not detect any wounded portion of intestine, but it was smeared on removal with blood and a dark coloured fluid having an unctuous feel. A second wound on the same side, about an inch in length, laid bare the eighth rib. The edges of both wounds were sharp and clearly defined, the hæmorrhage was profuse. Some small arterial twigs were twisted, and the bleeding otherwise arrested. Sutures of carbolized catgut were passed in both wounds. Those through the latter were at once tightened, though the lips of the former were left open. The wounds were well injected with 1 to 40 watery solution of carbolic acid and dressed. The patient was removed on a stretcher to his own home, and laid quietly in bed. A half-grain morphia suppository was given him. His pulse, before leaving, was 110 and very weak. The bleeding had ceased to flow externally.

January 2.—Twelve hours after the injury had been received, the dressings were removed, and found to be saturated with blood, quite antiseptic. Pulse 100, weak and slightly irregular. Skin hot, but moist. Tongue coated with brownish coloured fur. Pain and tenderness in the abdomen. Had slept two hours during morning. The dressings were renewed, and the half-grain morphia suppositories were to be given every four hours. On the evening of the second day his pulse was still feeble and over 100. Had slept none; opium not showing any physiological effect though four suppositories had been given. Pain in abdomen severe. He lay still and motion-

less in bed with knees bent; restrained his breathing, and spoke little, as he felt that they increased the pain. The dressings were renewed, and the morphia suppositories were to be continued.

January 3.—The opium had taken effect, the pain was lessened, and he had a few hours of drowsy slumber. Pulse 94, still weak. The wound looked well; no inflammatory indications. The dressings were soiled with blood, but the stain was dry. There had been no more grumous discharge from the wound. The sutures in the abdominal wound were tightened. Milk was given in mouthfuls at a time, and very frequently. The suppositories were to be given every six hours. No motion from bowels.

January 5.—Since last note he had been more or less under the influence of the opium. There was slight abdominal tenderness and tympanitis. He had many hours of dozy sleep. Pulse 94, feeble. The dressings of the abdominal wound were stained with serum; the wound itself looked well. The upper cut was looked at for the first time since it was dressed, and found to be healed; the knots of the catgut sutures lying loose on the surface of the wound. The suppositories were only to be given at night.

January 10.—He was much better. Pulse 96, stronger, sleep sound at night, pain and swelling subsided, the wound healing, about one drachm of pus on the surface and the dressings slightly stained.

January 12.—The abdominal wound was healed externally. No motion from the bowels since injury. He felt well, though he still experienced pain on movement.

January 14.—A teaspoonful of castor oil was ordered every hour until the bowels were moved.

January 15.—He had had two dark coloured motions, having a very offensive smell. Severe shooting pains were felt during the action of the oil, but were quickly relieved by fomentations on the abdomen. Light diet and tonics were given, and he was instructed to keep the recumbent position for a fortnight.

February 4.—Found him well, going about, and beginning to get strong.

Remarks.—In the first abdominal wound there was no evidence of intestinal penetration, though a knuckle of bowel was caught in the lips of the wound. In the second case, the dark coloured grumous fluid which escaped along with blood from the wound was indicative of penetration of the intestine.

II.—ON ARSENICAL WALL PAPERS.

By JAMES M-FARLANE, *Assistant to the Professor of Chemistry, St Andrew's University.*

IN a former number of this *Journal* (April, 1874), attention was directed to the subject of poisonous tapers and candles, particularly those in the manufacture of which arsenical green, vermilion, and chromate of lead, were used as colouring matters. The subject of the present communication is of even greater importance, from the fact that the employment of poisonous paper-hangings and pigments for wall painting is still practised almost universally,—a circumstance which demonstrates that the numerous and able notices relating to this subject which have frequently appeared both in British and Continental Journals, have been regarded with but languid interest. There was a time when the choice of brilliant green pigments suitable for such purposes was so limited that the use of arsenical compounds was perhaps less reprehensible than at present, when so many excellent greens, such as that magnificent preparation known as Chrome Green, have been placed at our disposal. In this country there has been practically no legislation affecting the very objectionable use of arsenical colouring matters for decorative purposes, although their employment even for these has been followed by numerous and well authenticated cases of severe and dangerous illness. The consideration that under all circumstances injurious effects are not observed to take place uniformly on persons of different age, sex, and condition of health, exposed to the influence of

these poisonous preparations, may to some extent excuse the disposition on the part of some to dispute the evidence which has been advanced by the most careful and competent observers.

The question of poisoning by arsenical wall-papers is a mechanical as well as a chemical one, the pigments being disseminated through the atmosphere of a room in the state of minute solid particles, which have been removed by friction or abrasion, as well as by the forming, under certain circumstances, of Arseniuretted Hydrogen—one of the most immediately active of the compounds of arsenic. A paper of this class with a uniform green surface usually contains about 20 grains of Arsenious Acid per square foot, so that a room of moderate dimensions, say $15 \times 12 \times 12$, will present a wall-area of 650 square feet, which will require a quantity of paper containing approximately 2 pounds of arsenic, or at least 2000 fatal doses. It is evident that the proportion of arsenic capable of being removed by friction alone, in such an apartment is considerable, and particularly if the paper is a flock one. That gaseous products containing arsenic are also evolved is quite certain from the fact that in damp rooms, and particularly those used as sleeping apartments, a strong alliaceous odour is generally observed, which is caused by the emanation of arseniuretted hydrogen, produced by the action of moisture on the arsenic, and such organic matter as may be present in the atmosphere of the room from the exhalations of its occupants or in the paper itself. The determination of the exact quantity of arsenic present in the atmosphere of a room at any given time is a matter of extreme difficulty, as it would be necessary to operate upon the entire volume of air in order to obtain anything like a tangible quantity for analysis: but the fact that the poison has been detected in the dust and sweepings of an apartment covered with arsenical paper, sufficiently shows that it is likely to be present in the atmosphere of such a room in a quantity fitted to give cause for alarm. It is really questionable whether analysis forms the most reliable means of establishing the presence of arsenic in circumstances

such as those described. The period over which even a single analysis or examination would require to extend in order to establish the presence, not to say anything of the proportion, of poisonous material, would render this method of testing for its presence exceedingly tedious, and in most cases impracticable. It is undoubtedly better to rely upon our knowledge of the properties of arsenical compounds in the circumstances which obtain when they have been employed in the decoration of any apartment.

The theory that particles of arsenic may become detached by friction, and thereby contaminate the atmosphere of apartments covered with arsenical papers, was supported by Pettenkofer, a Bavarian chemist, who was the first to advance this view, and was led to it by observing some minute flocks of arsenite of copper, which had fallen from the walls of a room covered with a green paper, and on dust being collected from various situations, such as underneath carpets, from picture frames, and from behind shutters, it was found to contain a large percentage of arsenite of copper. Some of a dark green coloured dust collected by Prof. Davy was found on examination to consist of arsenite of copper in a comparatively pure state. Professor Davy's views were afterwards endorsed by Dr Taylor, who at first was not inclined to favour them. It has been advanced, in opposition to this view, that a substance having the insolubility of arsenite of copper cannot be poisonous in minute dust; but when we reflect that many substances having extremely active properties—such as calomel, are equally insoluble, the objection at once loses weight.

Dr Taylor, however, has advanced another view with regard to the possible dissemination of arsenic. It is to the effect that arsenious acid may be volatile: at the ordinary temperature of the air, although the extent to which it is so may be too small to be appreciated by the ordinary chemical tests. We have a parallel to this supposed property in the case of mercury, and many other substances, which volatilise at common temperatures, at an almost imperceptible rate, but yet sufficiently to imbue a confined space of air with

their vapours. It is evident, then, that the friction theory has been well established, even if no other evidence could be adduced than the chemical analysis of the dust of floating particles found in apartments whose walls are covered by the objectionable pigment.

With regard to the theory of the formation of arseniuretted hydrogen by the decomposition of arsenious acid in presence of aqueous vapour and organic matter, perhaps the best confirmation which we have is the powerful arsenical smell which is always present when these substances have been in contact for a lengthened period. This odour is characteristic of museums of natural history by reason of the arsenic or arsenical compounds employed as preservatives, in stuffing and preparing the birds and other animals in the collection. But careful experiments to prove the actual presence of arseniuretted hydrogen in the atmosphere of apartments supposed to be contaminated by arsenic, do not seem to have been made.

These may be regarded as the chief theories which have been advanced with reference to the manner in which arsenic finds its way into the atmosphere of sleeping or other apartments, whose occupants, either from ignorance or carelessness, inhale perpetually an atmosphere contaminated with one of the most powerfully irritant poisons known.

The authenticated cases of poisoning by arsenical preparations used for decorative purposes are so numerous that it is surprising to find opposition still offered—chiefly, however, by manufacturers and other interested parties—to the statements and observations made by the most trustworthy and competent authorities, confirmatory of their noxious effects. Some of the cases are so well marked and striking in their character as to leave no room for doubt, not only as to the fact of the contamination of the atmosphere of rooms by arsenical papers, but as regards the prejudicial effects following the inhalation of the air of such apartments, even by parties in robust health. Evidence of this kind, and of an exceedingly instructive character, is

constantly accumulating, some of it, of the most trustworthy nature, being of very recent date. In the *Journal of Public Health* for August, 1873, a case is described in which the family of a gentleman suffered for 12 years from chronic poisoning, consequent upon the use of wall paper covered by arsenical green. In this case the most distressing symptoms were manifested, and the lives of not less than fourteen persons placed in imminent danger. Although no fewer than twelve London physicians of standing were consulted, the evil remained unsuspected, until by accident the attention of one of these was directed to the generally poisonous character of green wall papers. This led to the examination by analysis of all the papers that contained any green colouring matter in the rooms which had been occupied during that time, and the result was, that all were found to contain arsenic in quantities varying from 6 to 9 grains per square foot. The papers were at once removed, and in the process of removal the same symptoms in an exaggerated form returned, on account of the carelessness of the workmen in not damping the paper sufficiently before scraping it off; and on the walls being covered by new non-poisonous paper-hangings, all the effects, which were undoubtedly due to the arsenite of copper in the old papers, at once disappeared, and the entire household thereafter enjoyed the most complete immunity from their former complaints. In this case the evil escaped detection not only by the sufferers themselves, but by the medical men whose advice they obtained, on account of the chronic character of the poisoning. The example shows very clearly the necessity for removing old wall papers, more particularly those containing green pigments, most completely, before putting on new ones, the reprehensible practice of covering up old paper-hangings by new ones being too common.

In the same *Journal* (July 1st, 1874), Dr George Johnston, F.R.S., relates some very interesting cases of a similar character. In one of these, two of the occupants of a house in Birmingham, both in perfect health, took ill after two of the parlours were hung with bright green paper.

The symptoms were weakness, sore throat, headache, loss of appetite, inflammation of the surface of the eyes, with heat and dryness of the throat, and a feeling of tightness across the forehead. A parrot hung up in the same room also became ill and languid, refusing its food, and appearing constantly drooping. One of the inmates, on account of this illness, removed to a seaport town, where he rapidly recovered, while the other, who had remained at home, exhibited the same symptoms as before. In two days after his return he again took ill, upon which he suspected as the cause the green coloured paper-hanging. He then had the whole of the paper removed, and in less than a week after both had completely recovered.

The case of Dr Halley is also one of great interest, as he relates it in the *Times* of January 11, 1858. Within a few days after his study had been covered with one of the obnoxious papers he began to suffer from headache, dryness of throat and tongue, with internal irritation, although previous to that time he had been in excellent health. In about three weeks he became completely prostrated, almost losing the use of his left side, and was for some time under the care of two physicians. As soon as he recovered he returned to his study, when the same symptoms suddenly manifested themselves and unfitted him for work, until at length he found that when he worked for any length of time in this arsenic-papered room he suffered as before, but never when he remained in his other rooms, which were not so papered. He did not suspect the cause of his illness until he read in the *Medical Times and Gazette* Dr Hinds statement of his own case, and, being struck with its similarity to his, he examined the wall paper of his study, and found arsenic to the extent of nearly a drachm to the square foot. Upon removing this paper, and replacing it by a plain oak paper, he recovered perfect health, and had no return of the unpleasant and dangerous effects which he had formerly so frequently experienced.

The case of Dr H——, as related in the *Medical Times*, is, from the strong and well-defined symptoms manifested, one

of equal interest. These were, mucous membrane of the nose irritable, violent and unaccountable fits of sneezing, eyes dim, the senses of taste and smell deteriorated, discharge of mucus from the nose, broken rest, and all the distinguishing sensations of spasmodic asthma. On removing to Malvern many of the symptoms disappeared, and on returning the disagreeable effects were again experienced, and on another occasion of his absence from home the symptoms disappeared only to be resumed on his return. Suspicions were first aroused by his being seized with a violent fit of sneezing on his entering a small garden-room which had been papered by arsenical paper immediately previous to the commencement of his illness, and on an analysis of the paper being made it was found to contain an enormous proportion of arsenic.

An instance is mentioned by S. W. Butler, M.D., of Philadelphia, in the *Medical and Surgical Reporter*, of a lady who, on occupying a room, was seized with the principal symptoms of chronic arsenical poisoning. These were chiefly nausea, watering and weakness of the eyes, loss of appetite, broken sleep, great thirst, and a bitter metallic taste on the lips, and excessive vomiting after meals and during the night. The effects were not accounted for until an examination of the wall paper was made, when it was found to be highly charged with arsenite of copper. In this case illness was clearly traceable to the paper, as it was only upon occupying the room that the effects were experienced. On the removal of the paper they all disappeared.

The direct personal testimony of a medical man is of great value, less on account of his being able to analyse and determine the character of the symptoms manifested, than by reason of his skill and experience being frequently baffled by the subtle character of the effects produced by arsenic, administered in minute quantities frequently extending over a long period. The close resemblance between the effects produced in these circumstances and those arising from certain common complaints, and particularly choleraic diarrhœa, are so similar,

that they may readily be mistaken for each other; and poisoning is, perhaps, a cause of illness which only suggests itself to a medical man after all other means of accounting for its effects have failed.

Arsenical wall papers, however, are not the only means by which inadvertent poisoning by arsenic is accomplished. The noxious pigment is but too frequently employed, if not for colouring and decorating fancy articles of food, at least for wrappers intended to contain such. Jelly-pot and porter-bottle labels are frequently made with paper loaded with Scheele's green, which is readily carried into the vessels during the washing or cleansing of the latter. Toys are often painted with this pigment, made up merely with a little size or glue, and liable to be removed by the slightest friction or moisture. Artificial flowers and other fancy articles of a green colour are generally highly charged with this poisonous ingredient, and the health of the fabricators of such articles suffers. When we consider these sources of injury caused by one of the most virulent and powerfully irritant poisons, as well as those arising from poisoned tapers coloured with arsenite of copper, sulphide of mercury, &c., is it surprising that much illness should prevail which cannot be satisfactorily accounted for?

III.—CASE OF ENTERITIS WITH ULCERATION OF THE ILEUM AND PERFORATION OF THE BOWEL.

By J. D. MACLAREN, M.D., Physician to the Royal Infirmary, Glasgow.

CATHERINE F., *act.* 46, weaver, unmarried, was admitted to the Royal Infirmary under my care, on the 19th September, 1874. She enjoyed good health until the 24th August last, when she began to suffer from griping pains in the abdomen, and has suffered from them more or less ever since. Her bowels were very constipated, having been moved only three or four times during the month previous to her admission, notwithstanding the repeated use of castor oil, epsom salts, jalap powder, and laxative pills. Her appetite was much impaired. She had much thirst, and occasionally vomited both her food and her medicines. Two weeks before admission her abdomen began to enlarge, and has

been much distended ever since. She felt too weak to do any work or leave the house since the commencement of her illness.

On admission, her abdomen was much distended, and yielded a drum like sound everywhere on percussion. There seemed to be no tenderness over the abdomen, as she allowed it to be freely handled and percussed without complaining of pain. No tumour could be felt. She had slight griping pains occasionally. The liver and spleen were normal in size. Her tongue was furred and moist. She had very little appetite, but could take an egg to breakfast, and a little soup or milk during the day. She vomited occasionally, the vomited matters consisting of food and a clear fluid free from any bad odour. Her bowels were constipated. Pulse 76, and of good character. Cardiac sounds normal. Respiratory system normal. Slept pretty well at night. Intellect clear. Felt weak. Temp., 98·4. No œdema anywhere. Expression tranquil, and by no means that of a person labouring under serious disease. Her muscles were soft, but her body was not much emaciated. She generally lay on her back. Genito-urinary system normal.

She was eleven days in the hospital, the disease proving fatal on the 30th September. During the whole of that time she continued in much the same state as on the day of admission, with tympanitic abdomen, very little pain, and what there was of a griping character; torpid bowels, occasional vomiting, and weakness. Her temperature was taken five times altogether, and the thermometer never rose above 99·6. During the last two days of her life, however, she was evidently getting worse. Her expression became more pinched, her pulse weaker, her abdomen more painful and tender, and she vomited more frequently. She was evidently sinking on the 30th September, her pulse becoming imperceptible at the wrist towards evening; her extremities were cold and indications of collapse present. Her death took place suddenly at last. She got up to the night stool about midnight, before the night nurse could prevent her, and fell into a mortal faint, and died ere she could be put back to bed again.

The *Treatment* consisted in supporting her strength with such nourishment and stimulants as she could take. Her

bowels were moved every day, or nearly so, by a soap and water injection; and her stools were noticed to be lighter coloured than natural, but were so abundant, and occasionally so well formed, that there was evidently no obstruction. The torpor of her bowels was evidenced by the circumstance that scarcely any response was obtained to the use of three ounces of castor oil, given in the course of twenty-four hours in divided doses. She had ice given her to suck for the sickness, and when the pain over the abdomen became more marked, fomentations were applied. Once or twice galvanism was applied to the bowels in the hope of promoting their action, and dispelling the tympanitis, but without any good result.

Post Mortem Examination.—Her body was examined on the 2nd October. The heart, lungs, liver, spleen, and kidneys were normal. The intestines were everywhere much distended by gas. There was no fluid in the peritoneum. A few shreds of lymph were observed here and there over the peritoneal surface of the bowels, but a more extensive deposit of lymph existed over the lower eighteen inches of the ileum. That portion of the bowel was of a dark blue colour, and a perforation large enough to allow a probe to pass was noticed about six inches above the ileo-cæcal valve. The mucous membrane of the ileum was next examined, and over an extent of eighteen inches above the ileo-cæcal valve it was of a dark chocolate colour, and was furrowed by numerous, long, and narrow ulcers, the longest diameter of the ulcers being across the bowels. These ulcers invaded Peyer's patches, but were not confined to them, and had not the appearance of the ulcers seen in enteric fever. When floated in water a fringe of mucous membrane extended around their edges. Some of them were superficial, some extended to the muscular coat, and at one place perforation had taken place. The muscular coat of the bowel seemed swollen and softened on the affected part. The other portions of the intestines were healthy.

Commentary.—The first question which naturally suggested itself, on seeing the ulcerated condition of the ileum, with perforation at one place, and with the history of

an illness of five weeks' duration was, could this be a case of enteric fever? The symptoms during life, however, were certainly not those usually seen in that disease; and I am glad to have the support of Dr Joseph Coats in the opinion that the anatomical appearance of these ulcers of the ileum was not that of enteric ulcers. I have no doubt the disease was pure uncomplicated enteritis, going on to ulceration and perforation. The inflammation was limited to a portion of the small intestine, and the whole thickness of the bowel was involved—mucous membrane—muscular coat—and the peritoneal covering. It is to such cases, and to such cases alone, in my opinion, that the term enteritis should be applied. Much confusion and difficulty of description and of diagnosis have resulted from including under that term, cases in which the inflammation was a secondary matter; such as strangulation of the bowels, intussusception, or mechanical obstruction of any kind. I would also exclude cases of ulceration of the bowels resulting from typhoid fever or tubercular disease; I would even exclude the muc-enteritis common in children. All these diseases have symptoms peculiar to themselves, which are not found in the uncomplicated disease. I watched the symptoms presented by this patient with much interest during her life, because they are not the symptoms one would expect from descriptions of enteritis given by systematic writers, and they are almost exactly those I have observed in three other cases of this disease. I did not take notes of those cases, but the symptoms are clearly fixed in my memory. One of the patients died, and the *post mortem* examination revealed well marked inflammation of a portion of the small intestine, without ulceration however. The other two patients fortunately recovered, but on comparing the symptoms which they presented with those of the patients who died, no doubt is left on my mind as to the nature of their illness. The description of the disease given by systematic writers is to this effect.—The disease begins with chilliness, and shivering, and colicky pains in the abdomen, and tenderness on pressure. The temperature and pulse are high. There is

obstinate constipation, nausea, and vomiting; the vomited matter in bad cases being brown and fetid, if not actually faecal. Tympanitis gradually supervenes towards the close. The face becomes anxious and sunken, and death comes on with symptoms of collapse. Dr Bristowe, in Reynold's "System of Medicine," affirms that fatal cases seldom exceed a week in duration, and death may supervene within 24 or 36 hours. Now the chief objections I have to make to this description, read in the light of clinical experience, are, in the first place, that it conveys the idea of enteritis being an extremely acute disease, accompanied by much fever, and pain, and distress, and in fatal cases running a rapid course. My limited experience does not confirm that view of the disease. The patient, whose case I have narrated, was ill five weeks. She had scarcely any fever. Her expression was tranquil and placid, and she had no severe pain. In the second place, I consider the description defective in laying too little stress on *persistent tympanitis* as a symptom of this disease. That symptom is mentioned, but alongside of others, which seem to me subsidiary in a diagnostic point of view. In all the cases I have seen, it has been the one symptom which above all others arrested attention, and my chief object in publishing this case is to illustrate its importance. The principal symptoms besides tympanitis observed in this patient were torpor of the bowels, occasional sickness and vomiting, griping pains at intervals, and exhaustion. I am aware there is persistent tympanitis in the phantom tumour of hysterical girls, and there may be tympanitis in many other affections of the bowels, but none the less should its value be regarded in enteritis. As regards the treatment of the disease, I think the patients should be confined to bed, and should not be allowed to leave it for any purpose. The danger of permitting them to rise to stool, was shown in this case. The patient fell into a mortal faint, and it is probable that the perforation may have occurred at that time. The strength should be supported with such nourishment and stimulants as can be taken without exciting vomiting. The bowels should be moved

occasionally by injection or some purgative medicine. The free use of purgatives can only do harm. In the absence of pain I cannot see any advantage in giving opium. Fomentations or blistering over the abdomen might be useful. Turpentine I think likely to do good as a stimulant carminative. If the vomiting is troublesome the usual remedies should be resorted to. The question arose in my mind in this case, whether good would be done by the use of a fine trocar to draw off the gas. If the distention had been so great as to affect the breathing, or give rise to much distress, I should not have hesitated to use it, but it was not so distressing to this patient as to call for such a measure.

IV.—CASES ILLUSTRATIVE OF DISORDERED RESPIRATION FROM THORACIC ANEURISM AND OTHER CAUSES.*

By W. T. GARDNER, M.D., *Professor of Practice of Medicine in the University of Glasgow.*

I. *Aneurism of Descending Arch of Aorta, closely connected with the left Pulmonary Artery, compressing and opening into the left Bronchus; repeated Hemorrhages; Atrophy and collapse of left Lung, with quasi-cavernous signs in upper lobe; Laryngeal Cough and Hoarseness; pressure on left Recurrent Nerve.*

ROBERT S., aged 42, sailor, was admitted to the Glasgow Royal Infirmary on July 22, 1873, with symptoms which at once raised the question of intrathoracic aneurism, but mingled with certain other symptoms that seemed, not indeed to invalidate the diagnosis of aneurism, but to require some special explanation on this supposition. His more severe illness commenced only six months prior to admission, but he had been subject to palpitation of the heart for about 18 months. On admission, the symptoms which seemed to indicate aneurism were as follows:—

1.—Pain, constant in character in the region of the 6th dorsal vertebra, accompanied by occasional paroxysms of Angina Pectoris.

* Reported by Dr Samson Gamell and Dr Finlayson.

II.—The carotid pulse on the left side was decidedly more feeble than on the right, and the left radial, if not weaker, was certainly more compressible than its fellow.

III.—There was a distinct visible pulsation in the second intercostal space on the left side, and the flat of the hand laid over it was quite conscious of a tremor within.

IV.—A murmur, ventricular-systolic in rhythm, was heard all over the precordial region, but the site of its greatest intensity was immediately over the centre of the pulsation indicated above, about two inches to the left of the sternum in the second intercostal space.

V.—Cough, very paroxysmal in character, and having a distinct laryngeal quality, unattended by expectoration.

VI.—Hoarseness, which at one time amounted to complete aphonia, but had recovered to some extent, though still quite perceptible. This hoarseness was the first symptom of his more severe illness, and came on very suddenly.

VII.—Hæmoptysis, which had occurred suddenly one morning, about a fortnight prior to admission, to the extent of about a pint and a half of scarlet blood. It ceased suddenly after about ten minutes' duration. He said he was conscious of something giving way in his chest.

VIII.—Dysphagia, which at one time had existed to a considerable extent, but had been much relieved since the hæmoptysis.

IX.—Orthopnoea to a marked degree.

X.—Dulness on percussion over the region of pulsation.

These symptoms and signs, combined with a certain amount of twisting and induration of the radial and brachial arteries, seemed to indicate aneurism, but certain other features in the case did not tend so strongly in the same direction, viz.:—

I.—The pupils were quite equal, and responded readily to light.

II.—Laryngoscopic examinations detected nothing abnormal, in particular no paralysis of the vocal cords on either side.

III.—The whole left lung was dull to percussion, and this

completely prevented the mapping out of the cardiac dullness. The dullness over the lung was most pronounced at the apex, and over the entire left side the respiratory murmur was replaced by bronchial respiration, in some parts apparently almost cavernous in quality.

IV.—Nowhere did the dull percussion cross the middle line: on the contrary, the right lung appeared to a slight extent to overpass the middle line. There was no dullness in the region of the manubrium sterni.

V.—The pulsation in the second intercostal space was not very strong, and not localised so as to be distinctly separable from the cardiac pulsation. There was no arterial pulsation in the jugular fossa, but in the lower part of the neck, and for some distance upwards, a pulsation was visible to a marked extent in the right jugular vein.

The treatment adopted was the administration of iodide of potassium in doses of gr. xx., and confinement to bed. He improved greatly up to the 10th September, when he had a violent attack of hæmoptysis to the extent of $\frac{3}{4}$ of a pint. It lasted for about five minutes, but ceased on the administration of ice, and the subcutaneous injection of 5 grs. of ergotine. Marked improvement again took place, and on the 19th of September it was noted that the tremor to left of upper sternum had quite disappeared. The orthopnœa was gone, and the pain had quite yielded to subcutaneous injection of morphia. The other phenomena persisted, and in addition there was slight albuminuria, and some œdema of the feet and legs. On the morning of September 23, he was seized with a third violent hæmoptysis, which terminated fatally in a few minutes.

The *post mortem* examination made by Dr Coats on September 25, revealed the following facts. An aneurism was discovered arising from the inferior aspect of the descending part of the arch of the aorta, by an opening measuring two inches in the direction of the vessel, and about one inch transversely. The aneurism was about the size of a large orange, and passed down so as to be situated between the base of the heart and the left bronchus. The left pulmonary artery

passed along the inferior aspect of the aneurism, being firmly adherent to its wall, and very much reduced in calibre—the branches of the artery being in part obliterated, and those that remained barely admitting a probe. The left bronchus was in very intimate relation with the aneurism. From a point about one inch beneath the bifurcation to the termination of the bronchus, a distance of two inches, the anterior wall of the bronchus was entirely wanting. The aperture thus produced was occupied by pale clots, by which the calibre of the tube was filled, the opposite wall of the bronchus joining the wall of the aneurism at this point. The branches of the bronchus down to its finest ramifications were filled with dark clot, and the lung tissue was entirely collapsed. The left pneumogastric nerve passed down in front of the aneurism, becoming firmly adherent to the wall, so that dissection was precluded. The recurrent nerve was also found passing up the posterior wall of the aneurism, and firmly adherent to it. The cavity of the aneurism was filled in great part with firm adherent clot; but viewed from the aorta, a somewhat darker clot, with a smooth surface, which lay pretty free in the cavity, partly filled the large aperture. The heart was quite normal. The liver was slightly fatty, and the left kidney small; the capsule of the latter was adherent, and the surface slightly granular. Other organs normal.

Remarks by Dr Gairdner.—The diagnosis in this case was correctly made, but always subject to a doubt, not only as to the nature of the disease in the left lung, but as to its relation to the mediastinal tumour, or tumours, which were presumed to exist. While, on the one hand, pressure by an aneurismal tumour is a well-known and frequently described cause of pulmonary condensation, and even in some instances of disorganisation so closely resembling tubercle as to have been regarded as such by some first-rate authorities, on the other hand, carcinomatous disease of the glands and of the lung together would have afforded at least an equally good explanation of most of the symptoms and physical signs. In one other case, which was at one time

well-known in the Glasgow Royal Infirmary, I have observed characters not unlike the present, and after many years' close and repeated observation, the diagnosis still remained more or less doubtful, the symptoms having failed to yield a perfectly unequivocal explanation from the point of view, either of aneurism or of other mediastinal tumour. In this case, a woman, between 20 and 30 years of age, very stout and florid, was attacked with measles, and in the slow convalescence was observed to have all the physical signs of a general consolidation of the left lung, with blood-stained sputum, and other symptoms of pneumonia; afterwards signs resembling excavation developed at the apex, and then, very slowly and gradually, first a pulsation, then a murmur over the site of what was for a while presumed to be a tumour in connection with the aorta, and impinging on the upper lobe of the left lung; after this, in the course of many months, occurred several attacks of severe hæmoptysis, then a tumour formed beneath the left clavicle, which slowly came to the surface, ruptured, and gave exit to pure pus. Afterwards this abscess healed up, and still further evidences of atrophy of the upper lobe, if not of excavation, presented themselves; the patient all the while possessing to a considerable extent her original florid appearance; and (as compared with an ordinary phthisical case, at least) surprisingly good bodily condition. In this last case, however, laryngeal symptoms were, if present at all, of comparatively insignificant amount and transitory character. I am tempted also to mention briefly in this connection the case of a clergyman, who was, many years ago, under the care of Dr Christison and myself. A considerable tumour, obscurely pulsating, formed between the mediastinum and left lung, which, when it came to be the size, as of a very large orange imbedded beneath the surface, was regarded as certainly either aneurismal or malignant. Presently an enormous quantity of pus was brought up by the mouth, with complete subsidence of the tumour, which, however, came to the surface again, and on two subsequent occasions was similarly relieved. Ultimately the patient, contrary to

all expectation, became perfectly well, and for years afterwards performed all the laborious duties of a parish clergyman under specially trying conditions; dying, at last, not of anything connected even remotely with this disease, but of scarlatina.

II. *Syphilitic ulceration of Mucous Membrane of Trachea and Bronchi, giving rise to contraction of left Bronchus, and Spasmodic Stridulous Dyspnœa, not in any way relieved by treatment. Calcareous Degeneration of Bronchial Glands; the Pneumogastric nerve adherent, but not apparently involved.*

Mary M., aged 40, was admitted to the Glasgow Royal Infirmary, on October 7, 1872, with very urgent orthopnœa, the respiration being accompanied by laryngeal stridor. She dated her complaint six weeks back, but the more urgent distress had only come on nine days before admission. She imagined her illness was due to cold, but suspicion being roused by several depressed cicatrices over the bones of the head and face, inquiry elicited a distinct history of syphilis. She had a short annoying cough, unattended by much expectoration, and the fits of dyspnœa were by far the most prominent feature in the case. These fits occurred two or three times daily, and lasted from 10 to 15 minutes, but during the last 12 hours of life they were almost constant. Laryngoscopic examination detected nothing abnormal in the larynx—and the lungs appeared quite healthy, except that the air seemed to enter the right lung more freely than the left. The cardiac phenomena were normal. She complained of no pain, but had a sense of obstruction in the jugular fossa and upper part of chest, but there was no tumour, and the trachea was not displaced. The percussion also was good all over the lungs. During the spasms there was considerable lividity, and a certain amount of it, though not very much, was permanent. All the applications used did not produce any beneficial result, and even chloroform carried almost to complete narcotism left the stridor quite unaffected. Death resulted on October 12, after a very violent spasm.

The *post-mortem* examination was made by Dr Coats on October 15, 1872. In the trachea an ulcer about the diameter of a pea existed an inch and a half above the bifurcation. The

wall of the trachea was much thickened in its neighbourhood, and the ulcer had penetrated the entire thickness of the mucous membrane. In the neighbourhood of the bifurcation of the trachea there was very extensive ulceration, which extended into both main bronchi. Both bronchi presented marked contraction, but this was especially the case on the left side. On this side also the bronchial tube dilated considerably beyond the constriction. On the right side the constriction of the bronchus was less extreme. In front of the left bronchus, but not in immediate relation with it, was a pretty large mass of glands which had undergone calcareous degeneration. The vagus nerve passed very close to these glands, and was somewhat adherent to them, but could easily be dissected away, and did not appear at all involved. One or two flat calcareous masses were discovered on the surface of the pleura, and in the apex of right lung several such masses were discovered.

Remarks by Dr Gairdner.—There was enough of spasm and of stridor in this case to give importance to the diagnosis as bearing on the question of tracheotomy. The conclusion, however, justly arrived at, was that it was inadmissible, the obstruction being in the left bronchus. The nature of the obstruction remained doubtful to the last, and the diagnosis of tumour seemed not improbable.

III. *Extreme Dyspnoea in frequently repeated paroxysms, partly laryngeal in character. Expectoration of frothy non-purulent sputum, constantly blood-stained, probably for months before death, but no considerable hemorrhage. Small deep-seated aneurism opening into the trachea by a minute perforation, partially covered by clot. Several other aneurisms of no clinical significance.*

John M., aged 47, a tailor, was admitted on September 24, 1872, to the Glasgow Royal Infirmary, in such urgent distress from difficulty of breathing that immediate death was apprehended. The attack had lasted half-an-hour before his admission; it yielded to inhalation of chloroform; it terminated suddenly with a couple of slight coughs and the expectoration of some frothy mucus. The history of these attacks was carried back to the beginning of the year, but they were for some time slight, and only recurred after an interval of days. About five

weeks before admission they had become more frequent and severe, and at last recurred three or four times in the course of a day. The patient referred his uneasiness chiefly to the thyro-hyoid space and to the thyroid cartilage. This feeling seemed, from his description, to be rather one of obstruction than of acute pain. He also complained of a pain or uneasiness on the left side of the chest below the site of the heart: this had existed more or less throughout. There was a cough which accompanied the fits of dyspnœa; it was more marked towards the conclusion of them. The expectoration consisted of frothy mucus tinged with blood, and remarkably free from purulent admixture: the blood tinge was pure, and rather pink or crimson than rusty. A physical examination of the chest revealed no obvious cause of the illness. Bronchial râles, chiefly of the dry order, were audible, but there was no dulness on percussion, and the respiratory murmur, although by no means very distinct, was nowhere locally suppressed or diminished. Neither could any physical signs of aneurismal or other thoracic tumour be obtained; in particular, no substernal or localised dulness, no abnormal pulsation anywhere, no sense of tumour in the jugular fossa, no displacement of the trachea, and no inequality of the pupils or pulses.

A careful observation of the character of the breathing, and particularly of the slightly sonorous inspirations, with the deepened and somewhat choked quality of the voice, conveyed the impression that there was a laryngeal element in the case, although perhaps not an exclusive or predominating one, and this was more distinct at the height of the paroxysms than at other times. On laryngoscopic examination, however, the parts seemed normal, and the motions of the cords regular.

The urine throughout was non-albuminous.

During his stay in the hospital no treatment produced any permanent alleviation. Chloroform, nitrite of amyl, and steam were used by inhalation: chloral, in repeated small doses, and iodide of potassium were also given; poultices and blisters to the chest were likewise tried in vain. The expectoration became much more purulent, and the patient complained of a fœtor in the matter discharged;

this, however, was not very noticeable to any one else; the blood-stained character was preserved throughout. The laryngeal character of the respiration and the voice already referred to became less marked, and might latterly have been overlooked. The distress in the breathing continued as before, and the patient sat up in bed, almost constantly, leaning forward with his arms supported by pillows.

A fortnight after admission (October 8), the physical signs in the chest were found to be altered. Dulness on percussion was detected at the left base behind, at the right front below the third rib, at the right lateral region, and also at the right apex behind. Tubular respiration, with coarse crackling râles, were heard on the right side; in the left antero-lateral region a râle with a rather indefinite quality was also heard. The patient gradually sank, and he died on October 13.

The *post-mortem* examination was made next day. A small quantity of fluid was found in the right pleura; the bases of both lungs were condensed and coated with recent lymph; a small gangrenous cavity was found at the base of left lung.

On the left side of the anterior wall of the trachea a well-marked bulging was discovered towards the inner surface, the greatest prominence of which was an inch and a-half above the bifurcation. Just beneath the most prominent part an ulceration was found, and in the centre of this a perforation of very small diameter; this was found to communicate with an aneurism formed by a dilatation of the posterior wall of the arch of the aorta directly towards the trachea. The centre of the aneurismal aperture corresponded with the part of the arch nearest the origin of the left subclavian, but none of this vessel was involved. The aneurism itself measured $1\frac{3}{4}$ inch vertically, and $1\frac{1}{2}$ laterally. Its depth towards the trachea was comparatively small, but could not be accurately determined, as clots filled up the cavity nearly to the level of the aortic wall; these clots were firmly adherent, and closed up completely the aperture into the trachea. This aneurism was not related in any way

to the pneumogastric or its branches. The descending aorta had no less than five small aneurisms; the largest of these was about one inch in diameter. They were formed by slight localised dilatations of the vessel, and were lined with strata of firm fibrin. The organs of the abdomen presented nothing abnormal.

Remarks by Dr Gairdner.—The aneurism in this case was exactly in that part of the arch where it was most removed from direct observation, and therefore was only open to inferential diagnosis. The significance in such circumstances, even of *small* hæmorrhages like the present, and especially of such small hæmorrhages taken in connection with stridulous or laryngeal dyspnœa, has been very fully discussed in my *Clinical Medicine*, pp. 520-26, and a woodcut at p. 525 exhibits, in a case in which tracheotomy was ineffectually performed, an aneurism with "pinhole" perforation, not very dissimilar from that in the present case.

V.—ON THE TREATMENT OF PLEURITIC EFFUSION.

By D. FOULIS, M.B., Glasgow.

IT is apparent to any one who reviews the literature of the subject, or who sees much of the modern practice in cases of effusion of fluid into the pleura, that a bias exists in favour of the pneumatic aspirator as opposed to free incision, except in the last stages of this disease. It seems to me that a more extended use of the latter method may be urged on the profession, in view of the greater safety afforded by antiseptic dressing. The following case may be cited in illustration:—A. B., aged 3 years, admitted into Dr Gairdner's wards in the Royal Infirmary on July 27, 1874, had fallen ill on March 17 of the same year, with vomiting, shivering, pain in chest and head, and dry cough. The acute attack seems to have lasted a fortnight, but the feverishness and cough persisted in a more chronic form, and emaciation steadily advanced. On admission, patient was pale, thin, and undersized; the two halves of the chest

very dissimilar in shape and size; the left shoulder much depressed, and not moving in breathing; dorsal portion of spinal column curved laterally with the convexity to the right side; lower end of sternum lying to the right of the middle line. The body of patient bent sideways like a bow, head drawn down towards left shoulder; semi-circumference of two sides of chest equal, 10 inches; movement confined to the right side. Left side of chest quite dull, a faint whiffing being all that represented the breathing; breath sounds on right side puerile. Heart entirely displaced to right of sternum; the punctuate apex-beat $1\frac{1}{2}$ inches below the right nipple in vertical line. About $1\frac{1}{2}$ inches below and $\frac{1}{2}$ inch to the outer side of left nipple a fluctuant bulging tumour an inch and a-half in diameter. This tumour was opened antiseptically, on July 30, and several ounces of pus let out. The antiseptic dressing was carefully kept up, and an india-rubber drainage tube was forced into the wound between the ribs. The wound itself was freely enlarged whenever during the course of the case the slightest impediment to the discharge of the pus took place. Under this treatment the temperature soon fell from an average of over 100° to the normal figure; the appetite returned, and the shape and movements of the chest were gradually restored. The urine, which on admission contained distinct traces of bile, became free from it, though continuing to present hyaline and epithelial casts, with oxalates and uric acid in varying quantity: no albumen. By August 11, the daily discharge, which had previously been abundant, was reduced to a little serous fluid at each dressing; and on September 8 the wound was allowed to close up. The heart had now regained a perfectly normal position; the hepatic dulness was normal in extent and place; the left lung had resumed duty, and patient could lie on either side indifferently, while the deformity of the chest had become barely perceptible. When dismissed on October 3, the urine still contained casts, oxalates, and uric acid, but, as before, no albumen. The boy fat and cheerful. Seen again on January 1, 1875, patient was a rosy, chubby

boy, without a trace of the former deformity of the chest, and both lungs were acting equally.

This case is perhaps a very marked example of cure aided by natural elasticity of constitution, but nothing could be less encouraging than the aspect of the case when admitted, so much so indeed that hardly a hope of recovery was entertained by any one who saw it. The aim of the procedure throughout was to maintain a free and persistent escape for discharge until the cavity had quite closed up; and this was effected by the daily examination of the state of the opening by means of a grooved director, aided by the india-rubber tube always kept in; while the antiseptic dressing freed the patient from the constitutional disturbance which the wound would otherwise have caused.

Taking the question generally, it appears to me that the plan by incision and permanent drainage affords a much better chance of cure than that by repeated withdrawal of fluid by the aspirator. After each tapping, unless in the most favourable circumstances, reaccumulation of the fluid may be expected to take place, so that in reality the tapping only affords a temporary relief. Again, even supposing the pus or other fluid not to accumulate in large quantity, but to dry in as it were, we have before us the question of how far a cheesy deposit, such as would most likely be left, would be a source of danger to the patient afterwards, leading possibly to tubercular mischief.

In the last edition of Niemeyer's book (9th edit., Berlin, 1874), the rule is laid down that as soon as the fluid assumes a purulent character, as ascertained by exploratory puncture, a free opening should be made. Need we wait so long, in view of the grave results of the obstruction to the breathing and through it to the circulation—the congested state of the abdominal viscera for example? It is no doubt a much more onerous task to pursue for a lengthened period the antiseptic dressing of a wound in the pleura, than to puncture from time to time with the aspirator: but to those accustomed to the routine of Lister's method, it will be evident that the trouble will be more than repaid by the thoroughness of the result. My experience of the disease under discussion leads me to the opinion that, after due trial of medicinal treatment, the best

surgical course is to puncture as a preliminary precaution, and then, even although the fluid be not pus pure and simple, lay open the cavity containing the fluid, under the spray. The after treatment to be directed as in the case of ordinary abscesses.

VI.—MYRINGOMYCOSIS ASPERGILLINA AND OTITIS PARASITICA.

By JAMES PATTERSON CASSELLS, M.D., M.R.C.S., *London, Surgeon to and Lecturer on Aural Surgery at the Glasgow Dispensary for Diseases of the Ear.*

(Read before the Medico-Chirurgical Society on November 6th, 1874.)

THE case of ear disease which forms the basis of this communication is one of more than ordinary interest, because, till recently, *otitis parasitica* due to an aural fungus, was regarded by English aural surgeons as an exogenous disease, to be seen only in foreign *cliniques*. The chief interest of the case, indeed, seems to centre in this fact, viz., that the disease occurred in a person who had never been abroad, and was due to a true aural fungus.

In the early part of 1874, Hinton, our most distinguished Otologist, in anticipation of the approaching publication of his admirable work, since issued,* enquired of me if I had seen a case of ear disease caused by an aspergillus fungus, adding that he had not seen such a form of ear disease in England, nor did he know of any aural surgeon who had.

In reply, I was obliged to confess, that, in my own practice at home, I had not seen such a case, although I was familiar with the appearance that it presented, having seen it abroad; and that having regard to the opinion to which I have just referred, I had not looked for this disease, because I did not expect to meet with it. On reflection, however, over many cases of ear disease which had been under treatment by me, I could only now explain their peculiar symptoms and erratic course, by assuming that they were fungous in their nature and

* "The Questions of Aural Surgery," a review of which appears in the present number of this *Journal*.

origin. Hence, I expressed in that reply the belief, that the disease in question was not peculiar to the Continents of Europe and America, and that if diligently sought for at home the fungus would be found. Determined no longer to lie under the bondage of opinion in such an important matter, a bondage which, till now, had prevented independent investigation, I resolved to examine carefully every case, the symptoms of which gave reasonable grounds for suspecting the presence of an aural fungus. This was the result of my determination—in one week thereafter, viz., in May, 1874, I found *aspergillus flavus* in three cases; and in June, *aspergillus nigricans* in both ears in one case, and since then, several cases of the former variety of fungus have been seen by me in my private practice.

No English observer had hitherto recorded such a case, and, therefore, the discovery was considered sufficiently important to merit publication. This I had the honour of doing in the *British Medical Journal* in May last. (See "Note on Fungus meatus auditorii externi.")* Till now, my case of *aspergillus nigricans* (here for the first time fully reported) remains *unique*; but I do not hesitate to affirm that further and widespread investigation will show it to be far from rare.

The varieties of vegetable fungi, which hitherto have been found in the external auditory meatus, are the following:—*Aspergillus flavus*, *glauca*, and *nigricans*, and the *Otomyces purpurea*. This latter seems, from the statement of Wreden, its discoverer (see "*Arch. für Ohren und Augen heilkunde*") to be the ascomycete or utricular form of the *Aspergillus nigricans*. The *Penicillium glaucum*, *Graphium penicilloides*, and the *Trichothecium roseum* have been also found by Steudner and others.

Inasmuch as the three first-named fungi are those more commonly met with, and because, as yet, I have only seen the *glauca* and *nigricans* varieties, I limit my remarks to them. Indeed, seeing that the others were developed on slices of

* Shortly after the date of this "Note," a gentleman in one of the large towns in Yorkshire recorded the finding of the same variety of fungus in a case of ear disease, his attention having been called to the subject by the report of my discovery.

potato and disinfected cork by their discoverers, Hassenstein, Hagen, and Hallier, and not found in a fully developed state in the ear, it seems not improbable that the three first-named varieties of *Aspergillus*, which have been found developed in this situation, are the true aural fungi.

The characteristic structural peculiarities of the *aspergillus* fungi make it an easy matter to differentiate between them. Thus, in the *Asp. flavus*, the spore bearing sterigmata leave about $\frac{1}{4}$ th of the under part of the receptaculum uncovered, while in the *Asp. nigr.* these cover the whole receptaculum. Again, the difference between these and the *Otomyces purpurea* consists in these having no capsular sporangia, or asci, which the last named variety has.

Glancing for a moment at the history of the discovery of aural fungi, we find two cases of parasitic ear disease reported, respectively, by Mayer and Pacini ("Beobachtungen von Cysten mit Fadenpilzen aus dem äusseren Gehörgange" Müller's Arch., p. 401, 1844, and "Supra una muffa parasitica (mucedo), nel condotto auditivo esterno, Firenze," 1851.)

Notwithstanding these earlier discoveries of ear fungus, I think, in justice, all the honour of a new discovery belongs to Schwartze, of Halle, who, in 1865, first called the attention of otologists to the existence and frequent occurrence of a form of ear disease of a parasitic nature. (See Arch. für Ohrenheilk., B. ii. p. 5, 1865.)

The reports of the earlier cases failed to attract the attention of the profession, consequently their significance and importance in relation to aural therapeutics were unrecognised. The reports of Schwartze's cases at once aroused attention, and incited otologists to further search. The result showed that the fungus was not at all rare, for similar discoveries were made in various parts of the continents of Europe and America, chief among those who so reported being Wreden of St. Petersburg ("Arch. für Ohrenheilk.," B. iii., p. 1, 1867), and Roosa, Orne Green, and Blake in America. ("Trans. Amer. Otolog. Socy.," 1869, and "Amer. Jour. of the Med. Sciences," 1870.) Curiously enough, however, up till the date of my communication to the *British*

Medical Journal, already alluded to, no case had been seen, or if so, at least reported, in this country.

This supposed non-existence of parasitic ear disease in England was variously accounted for by aural surgeons, those most competent to express an opinion regarding its non-existence as due to some climatic peculiarity unfavourable to this low form of vegetable life—an opinion seemingly well founded, for, as I have just said, till now no case had been recognised or recorded by British aural surgeons. So much for the history of the progress of discovery of aural fungi.

Concerning the origin and development of these fungi, it is impossible to speak with any degree of certainty; indeed, in the present state of our knowledge, to do so would be unscientific. One important fact has been observed, that whereas *penicillium* is found nearly always associated with the aspergillus fungus out of the body, in the auditory meatus the latter fungus only occurs; nor from the *debris* removed in cases of aspergillus ear disease has it been possible to rear the penicillium. The number of cases of ear fungi at present recorded amount to about two hundred, so it does not seem unreasonable to regard this fact as settled, whatever may be its value or bearing. Wreden thinks it is a disease more commonly met with in those who live in damp habitations, and he noticed a case of frequent relapse due to sitting at a window, the sides of which were abundantly covered with the *Aspergillus* spores. He, in common with Nötling, has noted the history of cases in which the disease followed the introduction of a geranium leaf into the meatus for the relief of toothache. Inasmuch as toothache, of a kind, is a common symptom of some ear diseases, it is not improbable that the fungus existed before the introduction of the remedy named. Bezold considers that the prevalence of parasitic ear disease in Germany is owing to the habit that prevails there of instilling oil into the meatus as a domestic remedy in many ear diseases, forgetting altogether the fact, of which possibly he may not be cognisant, that a like habit prevails as extensively in Britain, where hitherto the disease had not been found, and was

believed not to exist. Moreover, the same objection applies to this opinion as was stated above—viz., that the disease for which the oil was instilled may have been of a parasitic nature, and further, that Sachs, the eminent mycologist, has shown that oil is a valuable parasiticide for such fungi, and that some aural surgeons on that account (Von Tröltsch, for instance) recommend the installation of oil in otitis *parasitica*.

That the recognition and removal of the fungus is followed by the cure of the disease, is indisputable, but whether the fungus is directly causative or only a concomitant and aggravator of already existing disease, whether some peculiar condition of the tissues of the canal pre-exists favourable to the germination of the spores once deposited, or whether, as some affirm, certain diseased conditions of the tissues can give rise, *ab initio*, to these low forms of vegetable life, are questions ably contested, but, for lack of evidence, undecided, and seem, indeed, to be further than ever from being so, in view of the failure of Wreden to propagate the fungus in a healthy ear. That this fungus is a true parasite, and not, as de Bary has affirmed, a saprophyte, is conclusively proved by the researches of Politzer, Weber-Liel, Wreden, and others.

These, indeed, are but conjectures that afford no aid in the solution of the mystery surrounding the origin of the disease; but it is well that this difficulty does not affect its therapeutics; for, as I already said, the removal of the parasite ensures the cure of the disease; a result which is suggestive of the question—What are the curative measures?

Before answering this question, however, it is necessary to speak of the signs by which one may *readily* recognise a case of ear disease, due to aspergillus. Speaking generally, the subjective symptoms from which the patient suffers are those usually met with in cases of ceruminous accumulation in the auditory canal, but, in addition, there is *pain*, not lancinating, like that of acute tympanitis, or the dull and throbbing pain of otitis *trombeuse*, but a burning deep-seated sensation, as if pepper grains were lying in the depths

of the external meatus; a sensation, moreover, which usually is not increased by pressure upon any part of the external ear region, and which is nearly always lessened or temporarily removed by injections of tepid water into the canal. These are the ordinary subjective symptoms from which patients suffer. The objective signs, which for purposes of diagnosis are of more importance to us than those just described, fall to be spoken of when I come to relate the history of the case which has suggested these remarks. Meantime, it may help to a better understanding of that case, if, in the first place, the natural history of the disease itself is considered.

It may be accepted as a well-established fact, that the aural fungi are immediate producers of diseased action in the tissues. This may be accepted even in the face of the statement of Lucac and others, that they have seen aspergillus growing in a healthy ear. If this were so, then these fungi could not be called true parasites, and de Bary's statement already referred to would hold good, that they were saprophytes growing upon dead matter, and promoting its more rapid destruction. Not doubting the *bona fide* character of Lucac's observations, I am disposed to say that *only in appearance* were the tissues of those ears healthy in which he observed the fungus growing. In my own experience, at a very early stage in the history of these cases, even when a very delicate *mycelium* alone is discoverable on the membrana tympani, I have observed an injection of the malleal vessels. Indeed, all observers are agreed that this seems to be the first observable fact in the train of morbid processes forming the natural history of cases of myringomycosis. Next, there is the formation of what appears to be a false membrane, which, gradually increasing in thickness, hides not only this injection of the vessels but even the true structure of the membrana tympani from view. At this stage there is decided impairment of the function of hearing. This gradually increasing deafness, however, is due to a mechanical cause, viz., the increased thickness of the membrana tympani, and not to the fungus: for only after

this false membrane is formed do the primary elements of the fungus become visible in the form of a delicate growth of mycelium. Springing out of this mycelial under-growth we by and bye find fruit bearing hyphens (either asci or conidia, with sterigmata and spores) of the fully developed fungus. The next step in the morbid process is the detachment of the pseudo-membrane, the exuviation of the epidermic layer, and exposure of the highly sensitive corium upon which the detached spores or asci lie, and increase the irritation. It is now that the subjective sensations of heat or pain are felt by the patient, and, as may be inferred, a great increase in the deafness. At no time is there a real purulent discharge from the meatus, unless the membrana tympani has been perforated and the tympanum exposed to direct communication with the external air, and then only from the irritation thus engendered.

Once recognised, the treatment of this ear disease is extremely simple. It consists in the complete removal of the fungus and the products of the inflammatory action, such as exuviated epithelium, pus, etc., from the external meatus, and the prevention of the re-growth of the parasite. This is generally accomplished without much difficulty by the free and judicious use of the syringe and tepid water; the cautious use of a suitable parasiticide and restoration of the tone of the tissues of the external and middle ear, if the latter has become involved in the diseased process. These measures carried out with due care for a few days ordinarily effect a radical cure.

Syringing with tepid water alone, without the subsequent use of a parasiticide, may suffice to effect a cure as some observers declare (Professors Roosa, Knapp, and others), but, for my own part, especially after studying the experiments of Küchenmeister, and the evidence which the history of the following case affords, I would not trust to it alone, nor would I rely upon a *watery* solution of any of the numerous parasiticides, with the exception, perhaps, of the hypochlorate of lime. I quite concur in the opinion expressed by Hallier, and confirmed by Küchenmeister, that of all parasiti-

cides those into the composition of which alcohol entered were most effective; further, that this efficiency was in reality due to the spirit alone.

Hitherto I have used alcohol either diluted or in full strength, and have good grounds to be satisfied with its action. The principle which may be laid down as a guide to those who desire to use this substance is this—do not irritate the already inflamed tissues; in other words, let the strength of the alcoholic solution fall far short of causing pain to the patient.

An unmarried lady, *æt.* 35, when a child had suppurating ears, the result of cold. Never had scarlatina or measles. For very many years previous to the onset of the present ear disease, she was perfect in her hearing, and free from any ear discharge. About two years ago (July, 1872) she went to reside at Matlock, at which time she had no ear disease. She left that place on the 8th of the following month (August, 1872) complaining of a fulness and burning heat in the right meatus, which after a time was the site of occasional lancinating pains. There was also considerable deafness, and slight discharge from the canal.

The patient is quite clear upon this point—viz., that previous to her visit to Matlock, she was, and had been for many years, free from ear disease.

She avers further, that the symptoms with which she was afflicted towards the end of her visit, were the result of exposure, instancing in support of this statement the following:—After sitting for a length of time on a stone in the open air, she first began to experience the burning sensation in the ear passage. She returned to Scotland on the date mentioned, with the symptoms above described. Originally affected in the right ear, no great length of time elapsed till the left meatus became the seat of similar sensations. All the symptoms becoming more severe, and the general health suffering, the advice of the family practitioner was sought and acted upon.

What may have been the nature of the diagnosis come to by him, it is impossible for me to say, but the patient

states that by his orders leeches were often applied, and very frequent vesication; on more than one occasion a blister extending round the neck, from ear to ear, having been applied. She also says she was mercurialised.

As may be conceived, no relief was obtained by these somewhat heroic measures, and the disease, coming to be regarded as a local manifestation of general debility, was left to take its course.

For a time there was a lull in the more disagreeable and distressing symptoms. This relief was due to the frequent use of the syringe and tepid water, by which means large masses of flaky-white deposit were removed.

After continuing for upwards of a year in this unsatisfactory state, there was a relapse. All the symptoms formerly complained of, and which had never been quite absent, returned with greater intensity.

No benefit following the measures which the family attendant had recommended, it was decided to seek the advice of some one familiar with affections of the ear. So far as I can gather from the statements of the patient and her family, the opinion of the consultant coincided with that of the ordinary attendant. The painful burning sensation, and occasional lancinating pains, were regarded as an irregular form of neuralgia, the result of the general debility. The remedial measures recommended were as unsuccessful as the former ones, and with the exception of occasional and temporary relief from syringing, the patient remained much in the same state up till June of 1874.

When she first came under my notice, she complained most of the left ear, and, in a very slight degree, of the right. There was much tinnitus, a constant burning, painful sensation in the ears, particularly the left, and occasional very slight discharge from it only. The hearing was much diminished, being for the right $\frac{1}{2}$, and left ear $\frac{1}{4}$. The naso-pharynx was congested and relaxed, tonsils slightly hypertrophied.

The right meatus presented a dry scaly appearance, and, with the exception that it contained no ceruminous zone, was normal on every other respect.

The right membrana tympani was yellowish-white in colour and opaque, this latter due to deposition in and between its several layers. Lustre much lessened, the cone being a mere speck. Curvature of membrane almost normal, except anteriorly, there it was very concave. Over the whole surface of the membrane a most peculiar appearance presented itself. On closer examination this was seen to be fungus-like in character, and consisted of a very delicate but finely developed undergrowth of *mycelium*, springing out of which were numerous fructiferous hyphens or *filaments* bearing black sporangia of a spherical form. The whole of the surface of the membrane was covered by the delicate white mycelium, not so by the filaments and their black capitals. Judging from the number of the latter that were visible, the number of the spore-bearing hyphens did not exceed one hundred.



FIG. 1.

Spore-head of *Aspergillus niger*, showing receptaculum and spores.—Magnified 140 diameters.—Mounted dry.

Portions of this fungus were detached and removed. Under the microscope they proved to be perfect examples of *Aspergillus Nigricans*.

Examination of the left ear showed it to be affected with apparently the same disease, but the appearances were

totally different. The meatus was nearly filled with large masses of dead epithelium, interspersed with delicate points of a dark or almost black colour.

A specimen of this debris was examined under the microscope, and proved to be made up of exuviated epithelial cells and other debris; the black points being the spore-heads of the same fungus, viz., the *Asp. Nig.*

After the removal of the fungus from the right ear, there was no change to note in the appearances presented by the meatus or membrana tympani. In the left ear, the meatus was denuded of its epithelial layer, and the dermis proper exposed up to the tympanic ring. The whole surface of the membrane being likewise denuded of its epithelial layer. Along the handle of the malleus, which was indistinctly seen, there was a much deeper degree of colouration. All the tissues were highly congested, and, as might be supposed, very sensitive.

Both Eustachian tubes were affected by chronic katarrh, their tissues thickened, and muscles weak.

In this case the diagnosis was obvious, viz., Myringomycosis Aspergillina (Mycomyringitis) of the right side; on the left, Otitis Aspergillina. The Eustachian Katarrh was doubtless quite independent of the parasitic disease of the external portions of the organ.

The satisfaction experienced at the discovery of the true nature of the ear disease was increased, when the practical results of that discovery were experienced.

In a few days the parasite and its effects were gone. The patient remained under treatment for a short time, on account of the Eustachian affection, and then was discharged, free from all trace of her former ear disease.

After the remarks I have already made, you will be prepared to hear that I relied alone upon the use of alcohol for the destruction of the fungus.

That the specimen of fungus, in this case, is what I represent it to be, you may judge for yourselves. Here is that removed from my patient, which you may compare with this specimen of the same variety of fungus, which I

had the pleasure of receiving from my friend, Professor Schwartze, the gentleman to whom, as you may remember, I have adjudged, at the outset of these remarks, the honour of discovering this form of ear disease.

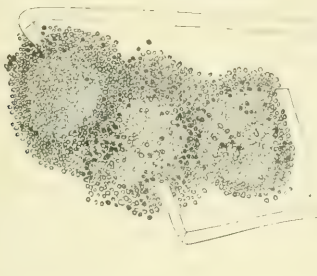


FIG. II.

Spore-heads of *Aspergillus niger* in Prof. Swartze's case.—Magnified 140 diameters.

BIBLIOGRAPHY.

Those who desire to prosecute the study of this subject may, in addition to the authorities named, consult with advantage, the following works:—

Sluyter, "De vegetabilibus organismis." Berlin, 1847.

Robin, "Histoire naturelle des végétaux parasites."

Hoffmeister's, "Handbuch, d. physiol. Botanik." B. ii., p. 225.

Fresenius, "Beiträge zur Mycologie."

De Bary, "Morphologie u. Physiologie des Pilzes." 1853.

Küchenmeister, "Die in u. an dem Körper des lebenden Menschen vorkommenden Parasiten." 1855.

Hallier, "Die pflanzlichen Parasiten." 1866.

Wreden, "Die Myringomycosis Aspergillina." 1868.

Hassenstein and Hallier, "Beobachtung eines neuen Pilzes des Graphium penicilloides." Arch. für Ohrenheilk., B. iv., p. 169. 1869.

Steudner, "Zwei neue Ohr-pilze," Arch. für Ohrenheilk., B. v., p. 163, 1869.

Also the excellent "Manual of Diseases of the Ear," by Professor Roosa, of New York.

See also an excellent paper by Wreden, in the IV. vol., part I. of *Arch. Ohren u. Augenheilk.* 1874.

Carl Cramer: "Ueber eine neue Fadenpilzgattung im Ohr," *Vierteljahrsschrift, d. Naturforschenden Gesellsch. zu Zurich*, 1859-60.

F. E. Weber-Liel: "Ueber Parasiten im äusseren Ohr, Otitis parasitica," *M.F. O.* 1868. B. ii.

T. Orne Green, M.D.: "A Parasitic Growth in the External Auditory Meatus," *Boston Medical and Surgical Journal*, 1868; and by the same author "Two cases of Parasitic Growth (*Aspergillus glaucus*) in the External Auditory Meatus"—*Trans. Amer. Otolog. Society*, 1869, p. 23-26.

Clarence J. Blake, M.D.: "Parasitic Growths in the External Meatus," same trans., 1871, pp. 30-33.

Bezold: "Ein Fall von *Asp. nig.* im äusseren Gehörgange." *Arch. f. Ohrenheilk.*, 1869, B. v, pp. 197-201.

T. Boke: "Zwei Fälle von pilzwucherungen am Trommelfell (*Myringomycosis*)" "*Hungarian Med. Chir. presse.*" 1869, 9.12.16.19.

Politzer: "Ueber pflanzliche Parasiten im Ohr" (*Weiner Med. Wochenschr.*, 1870, p. 2.

Von Tröltsch: "Lehrbuch der Ohrenheilk., Fünfte Aufl." 1874.

VII.—CASE OF EPILEPTIC HOMICIDAL IMPULSE.

By DR ALEXANDER ROBERTSON, *Physician to the Town's Hospital and Asylum, Glasgow.*

THE disposition in epilepsy to acts of violence of an instinctive and motiveless kind is well known. Sometimes it shows itself after recovery from the major fit, occasionally after the minor one, and in certain cases it is supposed, when associated with general maniacal excitement, to be substitutionary of either of these forms of seizure. In whatever way it arises, it is a feature of great importance in its medico-legal relations, and has repeatedly been the cause of much contention in courts of law,

when urged in palliation of criminal acts. In the following case the homicidal tendency was strongly manifested :—

A. C., inmate of the Hospital, age 60, has been epileptic for nineteen years. Till about a year ago there was usually an interval of a month or longer between the fits, but since then they have become more frequent, and lately he has seldom been a week without having a seizure. They are usually characterized by severe convulsions, but occasionally the movements are slight, and the attack partakes more of the *petit* than the *grand mal*. His intellect is weakened, the action of his mind being slow, but he entertains no delusion. A few weeks since, about 9 P.M., he rose from his bed to micturate, and while so doing he suddenly let fall the utensil, which was broken into pieces. Then he cried out for a knife, and declared with an oath that he would plunge it into the first person who came near him. The patient in the next bed jumped out and endeavoured to restrain him, but was like to be overpowered, and got his shirt torn in the attempt. Two others now came to the rescue, and together they succeeded in getting him into bed. My assistant, Dr Butler, at this time arrived, and that would be about five minutes after the fit began. When about forty yards distant from the ward he heard A. C. speaking in a loud, excited tone, though he could not make out the words. On addressing him at the bedside he clenched his fist, and would have struck Dr B. had he not been firmly held. I was now sent for, and saw the patient within a quarter of an hour after the commencement of the fit. He was then in bed, quite calm, but somewhat confused. On speaking to him regarding his conduct, and of his threat to stab his fellow-patients, he looked amazed, and declared with obvious sincerity that he had not the least recollection of having said so, nor did he remember any of the circumstances that followed the seizure. There was no return of the excitement, and next day I found him in his ordinary condition. Though he has had several fits since, there has been no recurrence of the homicidal tendency.

Remarks.—If this man had been in a private house, or indeed any where in company with only one individual, when seized with this murderous feeling, he might have killed his companion, without having consciousness of

the act at the time, or recollection of it afterwards. Though he had done so, there could be no doubt of his total irresponsibility for the crime. There might, however, have been considerable difficulty with the case in court, particularly if it were shown, or supposed, that the accused had some slight quarrel with his victim previously; for, the maniacal paroxysm being of so short duration, intelligence might have been restored before any one saw him, and there would have been nothing but the probability arising from the nature of the disease under which he laboured, to support the defence that the act was committed while he was in a state of complete mental unsoundness.

VIII.—ADAPTATIONS OF THE LARYNGOSCOPE AND TOURNIQUET.

By DAVID FOULIS, M.B., *House Surgeon, Western Hospital, Glasgow.*

I. AMONG the troubles which meet the beginner in the study of the diseases of the throat is the difficulty in obtaining a sufficiently familiar acquaintance with the normal appearance and phenomena of the interior of the larynx, to allow of exact appreciation of the slighter grades of disease. It is not within the reach of every one to procure patients on whom to practise examination; and autolaryngoscopy—the one method of obtaining a sound knowledge of the subject—is made practically impossible to the student by the high price of the apparatus sold for the purpose. Met by this last difficulty, when beginning the study of laryngoscopy under Schroetter, I put together an apparatus which is at once cheap and efficient, and which any one can make for himself.

Taking the common *Schusterkugel* of the Germans (to the use of which Stoerck and others are so partial in the examination of their patients), I fit it on to the end of a common tin candlestick by means of Canada balsam. The *Schusterkugel* is in common use among jewellers in this country, and is a glass globe about four inches in diameter,

with an aperture at one side. It can be had at any glass-work for a mere trifle, and when filled with water forms a powerful biconvex lens. Above it (as shown in *Fig. 1*), there is a small piece of silvered glass mirror, made concave on its lower edge to fit on the convexity of the glass globe, and held in position by two upright slips of tin. These uprights are

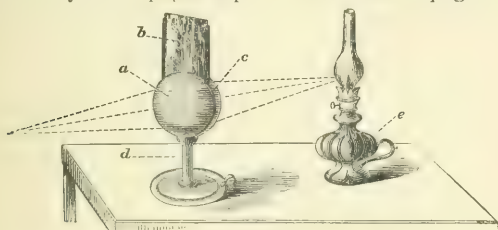


FIG. 1.

a. Glass globe full of water.—*b.* Mirror above it—*c.* Tin ring and uprights holding mirror.—*d.* Tin candlestick.—*e.* Petroleum lamp.

soldered to a tin ribbon which encircles the glass ball and is attached to the tin candlestick below: a tin crossbar behind the mirror unites the upper ends of the uprights. To give the light, a common glass petroleum lamp, costing one shilling or less, is the most convenient, as it can be raised or lowered by means of books or blocks of wood, and is always at hand. Gas, where accessible, is better. The lamp or gasflame is placed close behind the glass globe, and this last collects the rays in a thick pencil which should be made to fall on the fauces of the observer sitting in front. By means of the ordinary mirror of Türk, the pencil of rays can be sent down and the larynx can be lighted up and studied as the glass above the globe reflects the picture shown in the Türk's mirror. With this instrument I have been able to study on my own throat the physiology of the vocal cords; and to treat experimentally the interior of the fauces and larynx with the solutions and powders used in this specialty, so as to acquire exact ideas of the sensations of the patient under treatment. The chief merit of the apparatus is of course its cheapness and simplicity—not unimportant factors to the medical student.

II. The same advantages may, I think, be claimed for the following modification of the *Elastic Tourniquet*, with the addition that the "catch" for the band is quite new. A perusal of Esmarch's Pamphlet on the Bloodless Method, and a slight experience of the use of the elastic band in the operating theatre, convinced me that the one thing necessary to render the caoutchouc tube or rod an effective tourniquet was the discovery of a simple catch. The points to be kept in view were: easy application, easy and cheap manufacture, efficient grip of the india-rubber rod at any tension and at any point in its length. The idea of utilising the expansive force of the india-rubber itself in order to obviate the necessity for any clips or strings struck me as being the most practical; and I proposed to employ a brass tube of a less diameter than the rod. In the side of the brass tube a slit was filed; and the india-rubber cord, well stretched, was found to thin out so as to slip into the slit, expanding again on being let go so as to catch in the tube. I found, however, that it was more effective to pass the elastic rod twice round the limb and twice into the slit, so that the rubber caught against itself in the tube and firmly secured itself. This led to the idea of putting the brass tube in the centre of the cord, and after thinking over the various modifications in the shape of the tubes which any one can easily picture to himself, I fixed on the following as the best and simplest. An india-rubber cord, $\frac{1}{4}$ inch in diameter and 18 inches long, is selected. This is passed through a small piece of brass tube (see *Fig. 2*): to which again is soldered a longer bit of larger brass



FIG. 2.

The elastic band and catch.—*a*, Slit in brass tube—*b*, Smaller brass tube through which band passes.—*c*, Elastic band.

tubing, about the same bore as the thickness of the cord. In the free part of the latter tube a slit is filed. To apply the tourniquet, place the catch on the part, stretch the cord transversely, pass it under the limb, and bring the ends up again on opposite sides, slipping them into the slit one after another while still on

the stretch. When let go, the expansion of the caoutchouc causes the two ends to grip each other fast in the unyielding brass tube. To remove it, stretch the ends and lift them out of the slit. The tension can be of course varied *ad libitum*; and in taking off the band any required degree of slowness of relaxation can be attained with the greatest ease. It is not necessary to exert very great force in encircling the limb, as a moderate compression only is sufficient to stop the flow of blood in the vessels.*

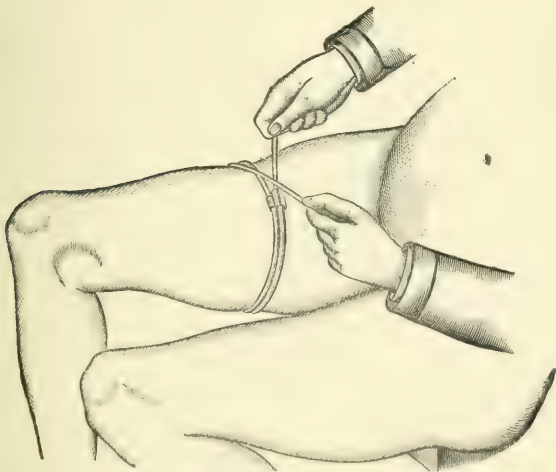


FIG. 3.

Mode of application of the elastic band : one end in the slit, the other about to be slipped in.†

Esmarch advocates the use of a preliminary bandaging from the distal end upwards, with an elastic roller bandage, just before putting on the elastic cord, so as to empty the limb, as far as possible, of blood. It is not necessary to do

* The tourniquet, as described, is made and sold by W. B. Hilliard of this city.

† I am indebted to my friend, Mr E. Reilly, student of medicine, for the drawings illustrating this paper.

this: the elastic tourniquet closes the vessels effectually, and converts them, so to speak, into so many pipettes with the chemist's finger on the upper end, unable to empty themselves of the blood contained in them between the incision and the tourniquet. The vessels in the part amputated, again, are seldom in a very engorged state, and simple elevation of the limb before application of the tourniquet suffices to ensure that no great quantity of blood shall be removed in the part cut away.

The rapidity of application of this tourniquet (4 to 5 seconds), and the great simplicity of its construction, lead me to urge its use in the army and navy, as well as for railway guards, policemen, and others who are suddenly called on to control hæmorrhage. As field tourniquet its use, I believe, will be found attended with the best results in saving blood and life, the application of the band being equally easy on the finger, the thigh, the pelvis, and the shoulder joint. To apply it in this last place, the catch is placed over the shoulder, and the cord passed below axilla and up again. If done properly, and with the turns of the cord close against the trunk, amputation at the shoulder becomes also a bloodless operation.

IX.—ON LARYNGISMUS STRIDULUS.

By W. M. MACCALL, M.D., Assistant Medical Officer to the Clinical Hospital, and Dispensary for Diseases of Women and Children, Manchester.

My attention was specially directed to the subject of laryngeal spasm in connection with another of the functional disorders of the nervous system, *i.e.*, tetany,* of which, in young children, it is a frequent concomitant, and my interest was afterwards re-awakened by several severe cases of laryngismus which came under my care. This affection can hardly be called rare in this country, but it is sufficiently uncommon in a well-marked form to make it interesting, especially when we consider its dangerous nature, as evidenced by the high rate of mortality attributed to it by some observers. As a clinical study it opens up questions wider in range than those concerning this phenomenon only,

* See Paper in this *Journal* for August, 1871.

involving its relations with the other forms of tonic and clonic convulsions to which infancy is liable, and which are often found associated with it.

The purpose of the present paper is to give a few practical remarks founded upon my own notes, aided by a study of such of the recorded cases of others as are accessible to me. I have not deemed it necessary here to put *in extenso* all my cases, as that would entail wearisome repetition, but simply to record a few which present the prominent features of the affection distinctly, or some unusual symptom. And, besides, in a number of the cases which occurred in my dispensary practice, the actual phenomena of the individual spasms have only been known through the description of the relatives. This objection, however, applies with equal force to many of the recorded cases of others—the attacks being so brief in duration, it is only by chance that the medical man has the opportunity of observing the child in one.

In the title I have retained the name by which the disease is most generally known in this country. A few cases are on record in which a single attack has proved fatal from complete closure of the glottis, and therefore without crowing inspiration having existed. In this light the name of *spasm of the glottis*, which is now adopted by most German and some English writers, might be preferable. And further, the symptoms in many cases indicate that not only the muscles of the larynx, but also the diaphragm and other muscles of respiration are spasmodically affected, which has induced the French to adopt the more comprehensive appellation of *convulsion interne*.* But changes of nomenclature are not desirable, and although our title only represents the most striking symptom of the affection, it is understood here to cover the others, whether occasional or invariable. Besides, it is not uncommon here for a mother to bring her child to us saying, "It is inwardly convulsed." In

* "La description des symptômes suffit pour démontrer que les muscles convulsés reçoivent pour la plupart les filets du nerf pneumo-gastrique. Ainsi les muscles du larynx sont convulsés aussi bien que les muscles inspireurs, et notamment le diaphragme aussi bien que les muscles expirateurs. Nous ajoutons que le cœur n'est pas toujours étranger à cette convulsion interne, qui se prolonge peut-être jusqu'aux intestins."—*Barthez, & Reboul-Maladies des F. p. p.* Second Edition. Paris, 1861. Vol. II. page 533

some cases this may be true; but in many we find that the child, suffering from abdominal pain, holds itself rigid, with clenched fists, head thrown back, and breathing suspended for a short time, till the countenance becomes crimson, and then cries loudly or sinks down pale and exhausted.

The case with which an accidental spasm of the glottis may be induced must be familiar to all. We give, for example, a dose of some stimulant, such as ammonia, in a form too concentrated; respiration becomes suspended, the child's face turns red, and then livid, and just as the alarmed onlookers think the little sufferer is about to die of suffocation, the breathing is restored—at first with a crowing noise, but soon naturally. Cases such as this do not, of course, fall within the category of disease, and equally we must exclude that crowing spasm which occurs in older children in connection with exhibitions of violent temper.

Spasm of the glottis as a genuine malady would appear to be more common in this country than in most others. According to Dr Smith, of New York, it is not frequent in America;* it is rare in France, Messrs Barthez and Rilliet having only noted 9 cases; in Germany, one of the recent writers on children's diseases, Vogel†, mentions only 15 cases of his own. Among English writers, on the other hand, Dr Reid‡, in his monograph, details fully 26 cases; Mr Robertson§, of Manchester, mentions 40 cases noted; Dr West|| 37; and many others

* *Diseases of Infancy and Childhood.* By J. Lewis Smith, M.D. Philadelphia, 1869.

† *Lehrbuch der Kinderkrankheiten.* Von Dr Alfred Vogel. 6th edition. Erlangen, 1873.

‡ *On Infantile Laryngismus.* By James Reid, M.D. London, 1849.

§ *Medical Times and Gazette*, 1865 Vol. I., p. 32.

|| *Diseases of Infancy and Childhood.* By Charles West, M.D. 6th edition. London, 1874.

A marked contrast to the statements of most other Continental writers I find in a work on *Diseases of Children*, by Dr Steiner, of Prague, recently translated by Mr Lawson Tait, of Birmingham. Dr S. speaks of 226 cases having come under his notice—150 boys and 76 girls. Possibly, however, he gives a more extended significance to the name than others do, as we find him in the preceding paragraph saying:

"Spasm of the glottis, when excited by reflex action, is generally due to some such condition as catarrh of the throat and primary air passages, and the introduction into them of foreign bodies, irritation of the mucous membrane of the larynx, hoarseness, croup, diphtheria and tubercular disease of the bronchial glands, constriction of the larynx from violent crying. Sometimes it may occur as a result of tickling, from irritation of the intestinal nerves in intestinal catarrh, accumulation of feces, or the presence of worms."

might be mentioned. My own notes include details of 22 cases.

CASE I.—Thomas C., aged 5 months, brought to the Dispensary of the Clinical Hospital, April 6th, 1869, and noted: "Pretty healthy till six weeks ago. At that time began to have spasmodic attacks, commencing with crowing inspirations, then becoming livid, throwing back its head, and working with its arms, the attack usually ending with crowing. Has been free from attacks for a week till last night, and since then has had 7 'fits.' Was vaccinated 6 days ago. In the intervals between the fits his food comes up in mouthfuls, without severe retching. The breast milk is scanty, and he has been fed on arrow-root and milk. Is not emaciating. Bowels regular. Mouth said to be occasionally drawn to left side. No squinting. Fontanelle depressed."

Prescribed Potass. Bromide, gr. iij., ter in die, and ordered to stop farinaceous food.

April 13th.—Had 3 fits, with unconsciousness, after leaving here, and, since, several crowing attacks.

No fits occurred after this, but up till May 4th, occasional slight crowing spasms, after which date they ceased. The bromide was continued till June 22nd, and then replaced by cod liver oil on account of the child's rachitic tendency. Last note made on July 16th—"No crowing. Weaned."

CASE II.—E. —, a blonde male, the first child of a highly-nervous mother, was born September, 1873. The mother suffered from deep suppuration in one breast, causing her much suffering for fully 3 months after confinement, but suckled with the other 3 or 4 times in the 24 hours. The child had to be fed from birth. He suffered much from gastric derangement—vomiting, severe abdominal pain, and occasional diarrhoea—motions usually pale and curdy. He had a degree of umbilical hernia from frequent crying. Various forms of aliment were tried, but it was difficult to get anything to agree well. Different remedies, such as bismuth, soda, pepsin, &c., were given. When a few weeks old, he had an attack of bronchial catarrh—not severe. When he was 2 or 3 months old, my attention was called to peculiar attacks which he took, and which I had repeated opportunities of seeing. In some of

these the child became rigid, with head thrown back, the respiration apparently suspended, the face becoming pallid, with blueness round the mouth and under the eyes. The infant looked as if choking, but after some seconds imperfect gaspings occurred, and then, with a loud, crowing inspiration, the attack was at an end. The blueness, however, remained for a little time. In others the same general appearances existed, the abdomen was drawn in, and after a few spasmodic heavings the breathing was restored, but without any laryngeal sound. Sometimes there were slight twitchings of the facial muscles, and at times the thumbs were firmly drawn in across the palms. For some weeks before, the child had made a crowing noise at times, especially when awaking from sleep, but they had not thought it necessary to mention it until alarmed by the other symptoms.

Potass. Bromide, gr. i., every 4 hours, was given, and a small doze of Dover's powder at bedtime. He very quickly improved, and in a week or two the attacks ceased, with the exception of occasional slight crowing when he cried. Up till this time he had not been out of the house.

Having remained well, he was vaccinated on February 5th, and on taking the matter on the 12th, I was informed that for 2 or 3 days there had been a return of his crowing spasms. On the 13th, I was hastily summoned, and found him just recovering from a severe attack of general convulsions. The bromide was again given and he had no relapse.

CASE III.—Matthew H., *æt.* 8 months, brought to Dispensary March 24th, 1874, and noted by Dr Sinclair.

Pale, stout child, said to have had bronchitis; a little cough remains. For a month past has taken fits of crowing—at times when awake, and generally when awaking from sleep. Described as “just as though his breath was stopped, and then he coos in a peculiar way.” Child had “convulsion fits” at first; worked in them 3 days, having as many as 12 in one day. Never had a day's sickness before. Is suckled, but has also been fed on bread, sago, &c., from birth. Bones of head soft; fontanelle very large for time of life; sutures open; no teeth nor any signs of their coming.

A child older than patient had "fits" up to $2\frac{1}{2}$ years old—"not crowing." Is now $3\frac{1}{2}$ years old, said to be healthy; is kept in the country. Another child "had convulsion fits during teething." None of the family had crowing fits. Three children are living, two dead.

Prescribed chloral hydrate, ℥i to ʒ ij. , a tea-spoonful 3 times a day; also cod liver oil. Cool sponging.

On *March 31st*, noted—"A great deal better, fits are much fewer, awakes quite naturally." After this he continued to improve. No attacks were observed after April 5th, and the child seemed well and lively. Last seen on May 1st, still well. No teeth.

These cases serve to illustrate some of the features of this affection in young children before dentition (unless we hold with Marshall Hall,¹ that "dentition begins at birth or even before"). In all of them artificial feeding had been resorted to from birth in consequence (in the two youngest at least) of a scanty supply of breast-milk. Case II. is especially interesting, as it presents a genuine example of *convulsion interne*, sometimes with and sometimes without signs of spasm of the glottis. In this case also, the pain and feverishness caused by vaccination seemed to induce the paroxysms, culminating in an attack of general convulsions on the 9th day, when the inflammation of the arm was greatest.

CASE IV.—C., a female, aged 9 months, was brought to me, 6th May, 1874, suffering from spasmodic contraction of the hands and feet—the hands flexed at the wrists, fingers stretched but inclined towards the palm, and the thumbs inverted. The feet were extended and the toes incurved, the great toe somewhat separated from the rest. These attacks had begun a week or two before, but were becoming more severe and persistent, sometimes lasting a whole day or more without intermission. On inquiry, I found that during the same period the child had been subject to frequent attacks of "stoppage of breath" with crowing. It was brought up on the bottle, with a great deal of farinaceous food. I have not noted the state of the gums, but my impression is there were no teeth.

¹ *Essays on the Theory of Convulsive Diseases*, by Marshall Hall, M.D., F.R.S.

A lighter diet was enjoined, and Potass. Bromide, gr. ij., every 4 hours given.

The child was not brought to me again at that period, but the mother told me afterwards that the attacks ceased after a few days.

In October of the same year the child (aged 14 months) died suddenly "in a fit," before it could be seen by any one. An inquest was held but no section made, and I could not learn the exact nature of the fit.

CASE V.—Sarah Ann W., act. 19 months, brought to Dispensary February 16th, 1869. "Has never been a stout, healthy child. Four months ago began to have peculiar attacks, in which the fingers get rigid, and the thumbs turned in across the palms; the feet pointed downwards. She suffers from pain when the rigidity becomes marked. Sometimes these last 3 or 4 days continuously, and she has never had a week's interval. Never had convulsions, but often takes fits of almost stoppage of breathing (whether with crowing is not noted)."

Prescribed Potass. Iodid., gr. ij., ter. die, and a proper diet enjoined.

February 23rd.—Had several attacks on 20th and 21st, one very severe, but less so than usual.

March 9th.—Since last here only 2 attacks, less severe; is better in general health.

March 23rd.—Dismissed well.

In the foregoing we have exemplified another element found in many cases, *i.e.*, carpo-pedal spasms (*contracture, tetanic*). These external contractions do not bear any necessary relation in degree to the severity of the internal convulsion. Not infrequently, indeed, the former alone have attracted the attention of the relatives, and the occurrence of crowing spasms is only mentioned incidentally, or elicited by questioning. A good example of this will be found in the case of Wm. B., recorded in this *Journal* for August, 1871. At 2 years old (March, 1869), he was treated for tetany with crowing spasm; at 3 years old (March, 1870), for the same; at 5 years old (February and March, 1872),

for tetany alone, unaccompanied by crowing, having got beyond the age at which we find spasm of the glottis. I have not heard of him since.

The next case I give as an example of the occurrence of laryngismus, carpo-pedal spasms, and general convulsions in the same child. Many such, both of my own and other writers, might be detailed to show the intimate association of the various forms of infantile convulsions, but perhaps the reader will be better content if we say, "*ex uno disce omnes.*"

CASE VI.—Called to see A., aged 18 months, the second child, but first boy, of a very nervous mother, on March 23rd, 1874. For several days had suffered from frequent attacks of crowing breathing at first slight, but now severe and attended with such lividity as to alarm the relatives, who feared he might choke. At times there was carpo-pedal spasm, but not lasting long. For some time before, he had been ailing—not eating well, and often vomiting. Conformation rachitic. No redness of the gums. A strict diet was enjoined. Potass. Bromide, gr. ij. every 4 hours given, with Pulv. Ipecac. Co. gr. i. at bedtime, as there was considerable restlessness, and the attacks were more frequent in the night. He quickly improved, and by the 1st of April the attacks had ceased.

He remained well till the evening of July 20, when I was again called to him. He was very feverish, with much heat and flushing of head. During the night he had 3 severe and long continued attacks of general convulsions. No crowing, but inversion of thumbs. After a sharp purgative, repeated enemata of castor oil and warm water were given, with the result of bringing away a large quantity of undigested fruit cake, which the nurse now confessed having given him on the previous day. He seemed to get on well till the evening of the 25th, when the head again became flushed, the thumbs drawn in, and the child very restless. Fearing convulsions, purgatives and enemata were again resorted to, with cold to the head, followed by the bromide, and the symptoms passed off.

He has had no fits of any kind since, but his digestion is still very feeble, and his diet has to be very carefully regulated in order to keep him well.

An interesting case has lately come under my notice, at the Dispensary, of that type in which the indications of laryngeal spasm are less marked, except at certain seasons, than those of affection of other respiratory muscles. I may be pardoned detailing it, although I cannot yet give the result of treatment.

CASE VII.—Henry I., æt. $2\frac{1}{2}$ years, brought to the Dispensary 3rd December, 1874, and then noted. At about 2 months old began to have fits, and has never been long free from them since. These have lately got more frequent and more severe. The convulsions seem more inward, except that the thumbs are turned in, and the feet and toes spasmodically extended. The attacks came on very suddenly, often when playing or sitting still, he falls down and becomes purple in the face. Occasionally injures himself in falling, and has at present a bruise on forehead from that cause. The spasms in hands and feet sometimes exist continuously for two or three days. In cold weather the attacks have been accompanied by crowing inspirations, which are just beginning again. He was fed on bread and milk almost from birth, the breast milk being scanty, and weaned entirely at 4 months old. Was late in teething, but exact age not remembered. Has only walked for 2 months, and is just beginning to talk. Fontanelle still open about $\frac{1}{4}$ inch. No cardiac bruit. No feverishness. Had measles in June last. Mother aged 30, has had 4 children: 2 are dead—one at 8 months old after “convulsions” for 2 weeks, and the other at 5 months old after “convulsions” for a few days. Ordered Potass. Bromide gr. iij. ter. die.

Dec. 10th.—The same. Hæb. Potass. Bromide, gr. v. ter. and ol. morrhue.*

Having now detailed a sufficient number of my cases to present a general picture of the affection and its concomitants, the notes of the others will be used in illustration of the casual and other circumstances relating to it.

* Since the above was sent to the printer, I have seen the child several times. He is very much improved, the following being the last note: *January 7th.*—“Much better; only one slight attack of drawing-in of the thumbs, lasting about an hour, and without lividity. Is much more intelligent, and the mother says, ‘He is not like the same child.’ Is now taking cod liver oil and iron only. Last winter the crowing spasms were so severe that the parents had to sit up whole nights with him, this winter, in spite of the greater severity of the weather, he has hardly had any.”

A review of cases presenting this spasm of the glottis must convince us that its predisposing causes are to be found in the same circumstances which give rise to the tendency towards the other convulsive affections of infancy. The frequency with which tonic contractions or eclampsia are associated with it, would, *a priori*, have led us in this direction. In 22 cases noted, I find that 7 presented carpo-pedal spasms, and 10 general convulsions; the latter did not always occur coincidently with the laryngismus, but often at other periods of the child's life.

First among these circumstances is *age*, and in this respect its bounds are more restricted than those of the other convulsive neuroses. It occurs almost exclusively within the first two years of life, or, as it is generally stated, "during the period of dentition." Thus, Mr Robertson, in the paper already mentioned, says, "I have in conclusion to observe, that in the numerous cases of stridulous crowing that have come under my notice, painful dentition has been the sole cause. I have never seen or heard of one instance of the disease before or after dentition—always during the teething period." This is certainly an oversight, as a number of cases had been previously published in which only a strained imagination could associate the attacks with painful dentition. Dr Reid, for example, mentions one case in which the symptoms began within the first month; another in which they began at 2 months old, and proved fatal at $3\frac{1}{2}$ months; and several before the age of 6 months. Cases occurring beyond the age of 2 years are more uncommon. Of my own cases, 4 were brought to me when under 6 months old, *i.e.*, one at 2 months, one at 3 months, and 2 at 5 months. If, however, we date from the beginning of the symptoms—in 2 cases they were said to have existed almost from birth, in 1 from 6 weeks, in 2 from 2 months, 1 from $3\frac{1}{2}$ months, and 2 from $4\frac{1}{2}$ months. In only 2 cases did I find it beyond the age of 2 years, 3 years being the most advanced age. Dr West says, "In 31 out of 37 cases of which I have preserved a record, the symptoms manifested themselves between the age of 6 months and 2

years, or just at that time when the process of dentition is going on with the greatest activity." Dr West, whose remarks on this as on all other subjects connected with infantile disease, merit the greatest deference, guards himself, however, against the inference that the spasmodic affections are therefore necessarily the primary result of dentition. Rilliet and Barthez (*op. cit.*, p. 526), on the same subject, "l'on doit reconnaître avec l'immense majorité des pathologistes que la maladie se montre presque exclusivement chez des enfants âgés de trois semaines à dix-huit mois, mais surtout de quatre à dix mois." And so with others. Hence has arisen the idea—*fallacy* would hardly be too strong a term for it—that because laryngismus occurs principally during the *period* of dentition, it is necessarily dependent upon the *process* of dentition—that it is a direct result of the mechanical irritation of cutting a tooth or teeth. The belief in the immense power which dentition exercises as a factor of disease—a power manifested not only in convulsive affections, but in so many other of the ills which infantile flesh is heir to—has been slowly losing hold of the medical mind. How much it is abandoned by those who have most familiarised themselves with the disorders of infancy, may be seen by any one who watches the practice at a children's hospital. How seldom it is that dentition, *per se*, is found to give rise to serious derangement, and how rarely we find the gum-lancet unsheathed. But the belief is yet very firmly rooted in the popular mind. How often, when we ask what is the matter with a sick child, do we get the unsatisfactory reply, "its teeth." Not only does this idea embarrass our enquiries by directing the attention of the relatives from other symptoms, but it has still more disastrous results. It is but too common to find infants brought to us dangerously or even hopelessly ill, especially with diarrhoea, for whom nothing has been done, because the parents deemed the malady to be nature's way of relieving the irritation of teething, and, therefore, not to be interfered with until their eyes are opened by manifest signs of danger. It is, therefore, a worthy aim in medical

practice to disabuse the popular mind as much as possible of the notion that teething is necessarily or usually attended by illness.

I do not go so far as to affirm that teething never gives rise to convulsion, or other disease, in children, but that it very rarely does so is a conviction which, I think, forces itself upon the mind of any one who observes with unprejudiced eyes. Like many young practitioners, I began with ideas of the immense import of teething; but I am now more than slightly sceptical. Nevertheless, I make a point of examining the gums in all such cases, for my own satisfaction, and in deference to the wishes of the relatives. I have not yet found in any case of laryngismus such a condition of the gums as seemed to me to necessitate interference. On the contrary, the teeth generally seemed to advance slowly, and without much irritation, a point which will be referred to later. In at least six of the cases, the affection had come to an end before a single tooth had pierced the gum.

But if not dentition, what other causes do we find operating at this age? It is a period of most active growth and transition in all the organs, and not least in those of the alimentary and nervous systems. The nervous centres are in a condition of peculiar impressionability, both to direct and to reflex irritation. The digestive functions are too often upset by artificial feeding, in addition to, or substitution for, the natural breast milk. In all, or nearly all the cases of spasm of the glottis, we find evidence of gastric or intestinal derangement. There is often vomiting; attacks of abdominal pain; the bowels are oftener confined than relaxed (in only three cases have I noted diarrhoea); and the motions generally pale and curdy.* In most we find that artificial feeding of an improper kind has been resorted to from an early age—almost from birth; that hand-fed infants are peculiarly liable to this affection; and further, that many cases begin

* Even the believers in the dentition causation notice this; e.g. Mr Robertson, whose strong assertion on the subject has already been quoted, in an earlier paper on the same subject, detailing 21 cases, says—"In all the infants there was derangement of the first passages; the digestive power was more or less impaired, and the motions were pale, or otherwise discoloured, and of a foetid colour." And a little further on—"I am of opinion that a spare diet is of incomparably more importance than any articles of medicine.

soon after weaning, especially where this has been premature. Dr Reid, in particular, has pointed this out, and the details of his cases are well worth studying. My own experience, so far as it goes, bears strongly in the same direction. The majority of the infants were artificially fed from soon after birth, as well as suckled, and an infant which died at $3\frac{1}{2}$ months never had any breast milk.

Connected with vicious alimentation is the fact that nearly all the subjects of spasm of the glottis present, in a more or less marked degree, indications of rickets. The statement of Dr Gee, that out of 50 cases 48 showed signs of rickets, accords with my experience, as with that of most others. The tardy appearance of the teeth, which is one of the early indications of the rachitic tendency, has, doubtless, tended to strengthen the belief in the influence of teething in the production of this and other convulsions, to which ricketty children are specially liable. While the teeth are slowly growing, the gums look full for a long time, but without special redness or tenderness. If we lance them under such circumstances, we shall probably have to do like a writer who mentions that he lanced the gums eleven times, over the upper front teeth, before they came through. Laryngismus is said to be most frequently connected with the cutting of the incisors.* The form of the incisors would lead us to expect that their passage through the gums would be the easiest. The statement means this in other words—that infants are most liable to be affected within the first 12 or 15 months of life. This is the period at which they are most susceptible to any form of irritation, and also that in which they are most liable to the dangers of improper feeding, or the great transitions of diet which weaning implies.

The physiological relations of the pneumogastric nerves might have led us to theorise on the importance of gastric conditions—an importance so strongly indicated by facts.

* "In connection with the ages of the infants is the kind of teeth, the irritation from which may be regarded as perhaps the chief cause of the disease. In 17 (out of 24 cases) the irritating teeth were the incisors; in 3 the bicuspsids, and in one the canine."—*See Ricketson.*

"Das Alter, in welchem das Uebel auftritt schwankt zwischen $\frac{1}{2}$ - 3 Jahren, d. h. es tritt auf mit dem Durchbruch des ersten Zahnes, und endet mit dem durchsetzen der zweiten Backenzähne, also in ersten Lebensjahre, stellt es sich viel häufiger ein, als bei den Eck- und Backenzähnen."—*Vierteljahrsschrift*, 1844.

Of the nerves which may be implicated, according to Dr Marshall Hall's statement,* the pneumogastric ought to take the first place, the trifacial last and least in importance.

The greater restriction as to age which laryngismus shows as compared with the other convulsions of childhood is possibly to be explained by the smallness and greater delicacy of the larynx in infancy.

Most writers are agreed that boys are more liable to this affection than girls, and it is theorized that already, even in infant life, there must be a difference in the form or physiological action of the larynx. My own cases show 16 boys to 6 girls.

That there is a hereditary element in some cases is indubitable. A number of instances are recorded where several children in the same family were attacked—in one case as many as 13 (Powell, Reid, and others). I have not yet found any such, but in several the occurrence of general convulsions in other children of the family is noted. In many cases I have found that the mothers were of peculiarly nervous temperament.

Climate and season seem to exercise a special influence in spasm of the glottis. As already mentioned, it is rare in some countries and common in others; it is rare in warm countries. In those in which it prevails, it is common in large towns, very uncommon in the country districts. The influence of season is still more marked. The malady is almost exclusively confined to the cold months of the year—particularly February and March. Of my own cases, 1 came under treatment in December, 1 in January, 5 in February, 8 in March, 4 in April, 2 in May, 1 in June, and 1 in July. The patient seen in July, however, had only, when under treatment, symptoms of internal convulsion, without crowing. Mr Robertson, whom I quote again as writing from Manchester, says, "Were these winds (*i.e.*, E. and N.E.) injurious, it would, indeed, be unfortunate, since, owing to

* "I venture to *suggest* another view of this matter as nearer the truth, *viz.*, that the disease is induced through the *fifth* pair of nerves in *teething*, the *pneumogastric* in indigestion, and *spinal* nerves in constipation, as parts of the *excito-motory system*." *Lectures on the Nervous System and its Diseases*. 1836.

causes I cannot account for, every instance of child crowing that I have seen has commenced in the winter or spring, as the following list of cases (of which I possess notes) proves:—In November, 1; December, 4; January, 7; February, 11; March, 13; April, 4—in all 40 cases.” Mr Robertson connects this fact, in his earlier paper, with the seclusion of infants within the nursery during the cold months, his cases having been chiefly among the better classes. This explanation may partially apply, but only partially. In most of my own cases there was no evidence that the children had been so shut up, except at my own request, during unusually severe weather. It seems more reasonable to attribute it to the depressing effects of cold on the nervous system and on the vital powers generally, together with the direct irritation of cold air on the larynx. Impurity, coldness, and probably dampness of the air—a combination existent in a high degree here at the season referred to—would seem to be the conditions most favourable to the development of this spasm. In a few cases, specially irritating atmospheres (as in a spirit cellar or newly painted room) seem to have excited it: but of this I have no experience.

It would be profitless here to remark on the various theories assigning a mechanical cause, such as enlargement of the thymus, pressure of enlarged glands on the vagus, cranio-tabes, &c. These have been dismissed now as altogether mistaken, or applying only to exceptional cases, and a discussion of their merits will be found in works on infantile diseases.

Once the disease is established, the exciting causes of individual spasms are very varied: among those mentioned in my notes I find crying, drinking, sucking, and in several cases the spasms are said to occur generally “just on awaking out of sleep.” Excitement, exposure to high winds, and intercurrent febrile affections, may also be mentioned as exacerbating circumstances.

It is hardly necessary to speak of the diagnosis. The only affections which might be confounded with it are, I think, spasmodic laryngitis and some cases of cyanosis from malformations in the organs of circulation: but even these can be readily discriminated by a little care.

It is startling to find the high rate of mortality assigned to this disease by Continental writers. Barthez and Rilliet had only one recovery out of their nine cases; Herard one out of seven; Vogel seven out of fifteen. Bouchut says one-third die asphyxiated—one-half at most are cured. M. Lorent, the German translator of Dr Reid's monograph, finds out of 289 cases 115 deaths, equal to a mortality of about 40%. They remark, justly, that this great apparent fatality is probably in excess of facts, as only the severe cases will be brought under notice. This would probably apply in equal degree to this country. Here, while the malady is more common, its fatality is very much less. Of Dr Reid's 26 cases 3 died; of 26 cases detailed by Mr Robertson 4 died, and of my 22, only 2 died while suffering from the disease, although a third died suddenly, "in a fit," about 5 months after it had quite recovered from the crowing spasms. Of the two, one died at 9 months old, from bronchitis and diarrhœa, three weeks after the measles rash appeared; the crowing attacks having lessened much for some time before its death. The other died at 4 months old, with marked signs of cerebral effusion. It had never been suckled, and was badly fed. The symptoms began at about 6 weeks old.

Although our prognosis of the disease generally may thus be favourable, in any one case it must be very guarded. Even in apparently favourable cases, the child may die suddenly in a spasm, or the condition may become complicated by general convulsions. In severe cases, there is also the risk of death by exhaustion or cerebral effusion.

Treatment.—As will be inferred, I regard as the most important element in the treatment, especially the preventive treatment of these cases, the careful regulation of the diet. It is very rare to find this affection in children at the breast, where the mother has a sufficient supply of good milk, and relies upon it. Where the supply is good, it is better to interdict all artificial feeding for the first 6 or 8 months of life, and then to begin gradually with milk and water (with lime water), followed after a time by some light farinaceous food. Where there is much gastric irritability, and milk is not well tolerated, it is often well to substitute for a time a little weak chicken broth, or Liebig's malt

food for infants, until the digestive powers are stronger. Weaning should be managed gradually, without sudden change of diet. Where infants at the breast are attacked, we generally find that they have been fed, almost from birth, with solid food, such as bread and milk—or, quite as often—bread and water, “because the two milks will not agree.” Among the factory classes here this is the general plan of feeding infants while the mothers are at work: and it is very difficult to persuade these mothers that their children can be sufficiently nourished on milk alone. Where the mother cannot suckle, if such symptoms present themselves at an early age, or if other children in the family have suffered, it is desirable to procure a wet nurse. If this be impossible, then the artificial nurture must be carefully regulated. Even where the pabulum is of a proper kind, it is apt to be given too often, or in too great quantity. Crying is taken to be an indication of hunger, and is ministered to accordingly.

In children over a year, the prevalent error is to stuff them with all sorts of dainties and “tasty” morsels from the parents’ meals. Such practices must be strictly forbidden.

As a rule, constipation exists; this at first may be overcome by a little rhubarb, with soda or magnesia. The bowels will probably act more regularly, and the motions assume a more healthy character as soon as the child is kept on a diet suitable to its age. In older children, and where the attack is more acute, it is often well to begin the treatment with a small purge of calomel, with jalap or scammony, aided by copious warm water injections. And in one or two instances, where there has been much heat and flushing of head, making one apprehensive of the onset of general convulsions, it has seemed to me productive of good to give small repeated doses of calomel for a few days.

Lancing the gums when they seem full, although not practised to the extent it was formerly, is still highly recommended in this country, and by some adopted almost as a matter of routine treatment in this as in the other convulsive affections of infancy. Believing, as I do, that the irritation of the gums by the teeth has very little influence in the production of the spasms, I think the cases in which

lancing would be advisable must be very few, indeed. Hitherto, I have not found it necessary to scarify the gums in any of my cases, although some parents would hardly think we had done our duty if we omitted the operation. Cases are on record where very slight causes, such as the mere examining of the mouth, have induced a fatal spasm, and how much more would the pain and alarm induced by scarifying be likely to cause such a terrible event. Those who recommend the operation advise it to be done with certain precautions. Among Continental writers, while the influence of dentition is referred to, the practice of incision is hardly mentioned.

Another *questio vexata* is as to the advisability of allowing the little patients to be freely exposed to the air, and here I imagine safety lies between the extremes. Where the cases are not severe, and the weather is moderate, I always recommend that the patients should be taken as much into the open air as possible, and have not seen any harm result from it. But in graver cases, and especially when cold N. or E. winds are blowing, I believe seclusion to be safer, taking care to ensure a pure atmosphere in the house. I have seen, in several cases, the symptoms aggravated by exposure in cold, windy weather. Mr Robertson's papers are written to show the benefit derived from free exposure; but this has always been accompanied by a *change* of air, generally from the damp, smoky atmosphere of Manchester to the purer, more bracing atmosphere of the sea-side. Under such circumstances, the beneficial effects seem to have been very marked, and I should be inclined to adopt this plan when the symptoms continue after the use of other means. In addition, cool sponging, or baths, have generally been used.

Among drugs there are several nervous sedatives which have a marked influence in allaying the spasms. Foremost among these my own experience would incline me to place the bromide of potassium. I have given it in the majority of my cases, and have seldom seen it fail to lessen, in a marked manner, both the number and the severity of the paroxysms. In some it has been crucially tested by the in-

crease of the paroxysms when the remedy was suspended, either intentionally or by misadventure. To infants of a year old, 2-3 grs., given 3 or 4 times a day, has generally proved sufficient. Sometimes, in addition, a dose of Dover's powder was given at bedtime, with the result of procuring a better night's rest. Dover's powder has not seemed to me to control the paroxysms, unless pushed to distinct narcotism; and as I have not cared to do this in Dispensary practice, I have not had much experience of full doses. Next to the bromide in efficacy, I would place chloral hydrate, which I have tried in some later cases, beginning with gr. i., every 4 or 6 hours, at 1 year old, and increasing cautiously, if necessary. It seemed here, as in pertussis, to act best when given to the extent of producing sleep.

In only one case have I administered chloroform; there the paroxysms were severe, and almost continuous, and general convulsions ensued. The child was kept under its influence about an hour, when the convulsions ceased, and the glottic spasms were milder. The first few inhalations produced increased spasm. This agent would give us the means of controlling the paroxysms in very severe cases, and give time for the action of other remedies. In severe spasms, threatening suffocation, dashing cold water in the face, and passing the finger into the fauces, seem the best means. In actual suffocation, tracheotomy has been spoken of, but I am not aware that it has ever been successfully carried out. The chances of success are, at least doubtful. Dr Handfield Jones says* :—"The sudden death, which is by no means uncommon in this disease, depends, I conceive, on the transmission of irritation along the cardiac fibres of the vagi to the heart, which is then arrested in its action, just as when the pneumogastrics are strongly galvanised." Happily, I have not yet met with such an event.

When the acute symptoms have passed off, I have generally given iron or cod liver oil, particularly the latter, where it agreed, on account of the rachitic tendency.

* *St. James's Hospital Reports, Discharges.* By C. Handfield Jones, M.B., Cantab. London 1870.

Reviews.

I.—THE INSURANCE CYCLOPÆDIA: *A dictionary of the definition of terms used in connection with the theory and practice of Insurance: A biographical summary of the lives of all those who have contributed to the development of Insurance: A bibliographical repertory of all works written upon the subject of Insurance and its associated sciences: An historical treasury of Insurance: also a detailed account of the rise and progress of Insurance in Europe and in America. And a compendium of vital statistics.* By CORNELIUS WALFORD, F.I.A., F.S.S. London: C. & E. Layton. Vols. I. & II. (from A to Equ), 1871-1874.

THE above title gives a full, and we may add a fair view of the scope of this remarkable work; we have only to mention in addition that the plan of the cyclopædia consists in its being composed by one man, in its being strictly alphabetical in the arrangement of its articles, and in the subjects of these articles being, as nearly as possible, chronologically treated. In such a heterogeneous mass of subjects as are here dealt with, almost every one will find some points of special interest to himself, wherever his pursuits may lie, and we might almost add that probably no one, however much connected with insurance business (always excepting the author himself), has much personal concern with *all* the matters here discussed. The subject of Insurance, and more especially of Life Assurance, has such direct connections with medicine that the titles at once raise the hope of this cyclopædia containing much that concerns our profession; and it is because a perusal of the work has convinced us of the valuable character of many of the medical or *quasi*-medical articles in these first two volumes, that we now desire to bring this laborious compilation under the notice of our readers.

The author has not sought to produce merely a body of doctrine in this work, for, as he justly observes, the value of such would depend on the value of his own personal opinions (and so would no doubt be very unequal), but he aims at presenting "blocks of solid material even in their crude authenticity, just as by hard and constant digging they were brought to light." The value of these "blocks" thus presented may be judged of when we think of the immense variety of sources from which they have been procured. Fugitive pamphlets and reports of companies to which access is difficult or impossible; careful medical surveys of insurance mortality by such men as Christison and Begbie; reports of papers and discussions at meetings of actuaries often prolonged into controversies conducted by

correspondence in the Insurance or other magazines; reports of the Registrar-General, and especially Dr Farr's invaluable additions; transactions of the Royal Societies of London and Edinburgh, of the Statistical Society, of the British Association, &c., and the almost illimitable field of medical periodical literature, have all been put under contribution in a way which we confess has somewhat astonished us. As a "bibliographical repertory" we estimate this cyclopædia very highly, supplying as it does references to subjects not easily reached.

We do not notice, however, any references to the valuable reports issued from our sanitary department in Glasgow, to which, probably, the author has had no access. We would suggest to him that the returns of the mortality for different districts in this city, calculated according to the population, supply materials of much value, as showing the great variation of the death-rate among different social grades of the same community, a matter of much importance in Life Assurance studies. This laborious statistical inquiry, begun by Dr Gairdner and further elaborated by Dr Dunlop, has been continued by Dr Russell, and supplies data, the importance of which must be recognised wherever they become known.

The two most notable articles, from the purely insurance point of view, are undoubtedly those on "Annuities" and the "Equitable Society," each occupying about the whole of one of the eight parts which constitute a volume—*i.e.*, about eighty pages. The first of these is highly historical, and is certainly tough reading; it would require an enthusiast to read it, much more to write it. The author agrees with those who trace the decline of annuities in popular favour to the abolition of the usury laws. The history of the "Equitable" is likewise treated in a thoroughly historical manner, and its 112 years supply a most interesting story of the rise, difficulties, and progress of life insurance in this country. Articles of much general interest occasionally crop up. The distinction of the meaning of assurance and insurance is discussed under the first-named word. Mr Babbage thought *assurance* referred to a contract on a certain event which must happen or fail, such as death in the case of life business, *insurance* on an uncertain event, which might partly happen or partly fail. This certainly meets the current usage of the two terms, but seems scarcely tenable. Mr Sprague suggests the distinction that a man *insures* his life or property, the company *assures* him of a certain sum in the event of death or loss. Mr Walford believes the correct distinction to be that *assurance* represents

the principle and *insurance* the practice. After this discussion follows an enumeration of sixty-four different kinds of insurance arranged chronologically! The account of "calculating machines," and of the wonderful analytical engine contrived by the late Mr Babbage, is well fitted to arrest the attention of the general reader, and justly claims a place in this work, seeing that Dr Farr's "Tables of life-times, annuities, and premiums," were in part calculated and printed by Scheutz's machine. Touches of humour even are not absent in this ponderous cyclopædia. Referring to the "Ark Indisputable Mutual Assurance Society," "which dragged on its slow existence until the year 1856, when it broke up and became a total wreck," he refers to "a prospectus of this association with the following Scripture quotation employed as a motto: '*But with thee will I establish my covenant; and thou shalt enter into the ark; thou, and thy sons and thy wife, and thy sons' wives with them.*' We suspect it was a bad business for those, and the sons and daughters of those, who did enter that ark." But of course the chief interest in such a work, so far as we are concerned, centres in the medical articles; these constitute some of the most important portions of the cyclopædia. Points of much medical interest are also referred to incidentally, and discussed in some of the other dissertations, such, for example, as in the article on "Concealment," which has many medical as well as legal bearings. The following headings, however, may be given as those to which we wish specially to direct attention, and we add some of the sub-divisions and the number of pages occupied, so as to indicate how the questions are treated.

BIRTHS: BILLS OF MORTALITY (pp. 20.)—CHILD-BIRTH, *Deaths from, Risk of.*—CHOLERA (pp. 25.)—CONSUMPTION (pp. 30.)—DEATH, *Ages at, at Sea, Causes of, Hour of, Presumption of, Proof of, Death Rate, Statistics of, &c.* (pp. 45.)—DISEASE: DISEASED AND IMPAIRED LIVES, *Insurance of.*—DISEASES, *Classification of, Development of, Geographical distribution of, Hereditary transmission of, Influence of age upon, of habits on, of locality upon, of seasons on, Registration of, &c., &c. (in all 83 pages).*—EPIDEMICS, &c. Much medical information is also supplied under the sections on the mortality experience of the various offices whose history is given, and also in the summary of discussions on Dr Farr's English Life Table.

Consumption occupies the most prominent place in the Nosology of Life Insurance, not merely on account of its great prevalence in the general population, but also on account of the

early age at which its victims succumb. The combination of a medical physical examination, with strict inquiry into the family history of the proposer, affords great opportunities for reducing this class of risks, and the success thus attained is in point of fact very great. Thus, in Mr Meikle's *Observations on the rate of Mortality of Assured Lives as experienced by 10 Assurance Companies from 1815 to 1863*,—out of a total of 11,917 deaths it was found THAT ASSURED LIVES DIE IN LARGER PROPORTIONS THAN THE POPULATION FROM (Registrar's Classification) Class I. Zymotic diseases. IV. Diseases of the Brain. V. Diseases of the blood vessels (after age of 45). VI. Diseases of the lungs (after age of 70). VII. Diseases of the stomach and liver. VIII. Diseases of the kidneys. IX. Diseases of the organs of generation (females): and THAT THE POPULATION DIE IN LARGER PROPORTIONS THAN ASSURED LIVES FROM Class II. Diseases of uncertain seat (cancer, gout, &c). III. Tubercular Diseases. V. Diseases of the blood vessels up to the age of 45. VI. Diseases of the lungs up to the age of 70. XIV. and XV. Atrophy and old age; and XVI. and XVII. Accidents and violent deaths. It is most interesting to notice how the analysis of the figures gives results so clearly intelligible by a medical mind, when the possibilities of foreseeing or recognising the different diseases are considered, and also the ages at which insurance is usually effected. With regard to consumption, the following figures by Dr Begbie show the proportion of deaths from consumption to those from all causes in the Scottish Widows' Fund from 1815 to 1866:—

Ages at death.	All Causes.	Consumption.	Ratio per cent.
Between 20 and 30	124	37	29·83.
“ 30 “ 40	137	89	20·36.
“ 40 “ 50	694	73	10·51.
“ 50 “ 60	914	54	5·91.
“ 60 “ 70	852	23	2·70.
Above 70	650		
Causes not ascertained	34		
	<hr/> Total, 3705	<hr/> 276	<hr/> 7·45

From the mortality returns of London in 1845, Professor Christison calculated that $17\frac{1}{2}$ per cent. of the deaths of males above 30 years were due to consumption. This may serve to indicate the great difference in the mortality of the insured from this cause.

In his report for 1860-66, Dr Begbie announced 96 deaths from this cause, out of 1398 deaths. Of these 96, some family suspicion was entertained at the time of effecting insurance in 18 cases (one death from phthisis of a

father, mother, brother, or sister), and in 15 other cases some personal or family suspicions of various kinds likewise existed, but were supposed to be counterbalanced. None of these 96 attained their expectation of life, and only in 9 was an increased premium charged. The average duration of the policies in the consumptive deaths had been twelve years and eight months—a remarkable testimony to the care of the medical examiners.

These facts raise two very important practical points in Life Insurance—the limit to be drawn in the case of a consumptive family history, and the question of increased premiums in doubtful lives. The rule followed by some of the best companies seems to be, not to regard one death from consumption in the family as a bar to insurance, but to regard two such deaths as a bar, unless under other specially favourable circumstances. Dr Bégbie, in 1860, said this rule had been followed by the Scottish Widows' Fund for twenty-five years at least, and that "the experience of the society amply justifies its continued application, with certain exceptions hitherto acted upon, such as arise from the age, sex, constitution of the proposer, the number of his family, the proportion of those who have been affected with the disease, and the period he may have survived the age which proved fatal to his relatives." This consideration of the diminution of consumptive risks with advancing years, although doubted at first, seems now to be admitted by the best authorities as perfectly established, at least, regarding the class of persons who apply for insurance. In 1853, Sir Robert Christison adduced evidence from the *Standard's* statistics, "to show that whatever may be the frequency of consumption in the general population after middle life, it becomes progressively a less frequent proportional cause of death among lives accepted for insurance at a later period of life; that the risk from it is not great after 40, very small after 50, and quite insignificant after 55."

The table already given in this review from the Scottish Widows' Fund (1868) tells the same tale. Dr Fleming (1862), in his investigation of the mortality of the Scottish Amicable, says: "From my observation on the whole subject I incline rather strongly to the opinion that the hereditary or constitutional proclivity is well exhausted by 45, presuming that the individual is then strong and hale." Dr William Robertson, in his Supplementary Report on the mortality of the Scottish Equitable (1866), expresses his opinion on this important point

thus: "In short, there are cases in which the occurrence of two or even more fatal cases of consumption among the immediate relatives of a proposer need not be considered an insuperable bar to his eligibility for assurance at the ordinary rates, if he has passed middle life, and the personal points in his history favourable." The inference from these weighty opinions, based on the actual results of insurance mortality (and according so well with the doctrine and experience of this disease in general) seems to be that it would be fair for Insurance Companies to relax the claim for additional premiums on *fresh* policies granted in later life, if the conditions are favourable, even although extra may have been properly enough charged on the first risk. We suppose, however, that when once an "extra" has been charged, it seldom happens that additional policies are granted at the ordinary rates either by the same or any other company.

This leads up to the other question to which we referred, viz:—the practice of charging increased premiums. Some companies, struck with the fact of lives proving excellent although loaded with an "extra," from personal or family considerations, have conceived the idea of allowing the proposer to show by his longevity that the medical advisers or directors were wrong in thus classifying him, and have devised various methods of restoring him in time to an equality with the ordinary risks. Such methods seem to us—viewed from the medical standpoint—to be essentially fallacious. In adding a few years to a man's age the medical adviser makes no profession of estimating that a given illness suffered by the proposer, or a given fact in his family history, may be expected to take that number of years off his life. It is only an exceedingly rough method of estimating what seems to him the relative gravity of a deviation from a fair risk. Of the 96 deaths from consumption already referred to in his review, 9 policies had been issued at small extra premiums, but of course the addition thus gained to the company was altogether insignificant as counterbalancing the loss from these 9 risks: the real counterbalancing effect of such "extras" comes in with regard to cases which really outlive their expectation, or which die in the ordinary course from causes quite apart from the extra risk thus estimated. In fact the additions made must be regarded, like the ages themselves, as subject to the law of probabilities, and as mutually corrective. This subject is fully discussed in the cyclopaedia under the heading, DISEASED AND IMPAIRED LIVES, and the opinion of most of the insurance authorities seems unfavourable to the above method.

This article on DISEASED AND IMPAIRED LIVES is one of the

most instructive in these volumes. The time has not yet arrived for attaining very precise or comprehensive results on this interesting and important subject. Many offices make no insurances of lives having more than a very slight deviation from the healthy average; indeed, this applies to nearly all the offices whose diseased life mortality Mr Meikle has investigated in Scotland. He says that "the lives not assured at ordinary rates, sometimes termed 'imperfect lives' or 'diseased lives,' and numbering 3551, of whom 496 died, seem to have experienced a higher rate of mortality than would have been provided for them by the Carlisle or Actuaries' (17 offices) Tables as healthy lives. The rate of mortality of diseased assurance lives is, at ages under 60, about 20 per cent. greater than healthy assurance lives, but the difference between the rates of mortality on healthy and on diseased lives is very much less than the difference between the rates on assurance 'with' and 'without' profits, which shows that the constitutional infirmities detected by the medical officer are not so unfavourable as the grounds of the secret motives which determined the assured to select assurance at the cheapest non-participating rates of premium." He further points out that "the mortality on lives charged extra for defective personal health greatly exceeds that on lives charged extra for unfavourable family history." Mr Meikle, in another part of his observations, remarks that "a classification of the causes of death of 'diseased lives' points out the interesting medical fact that of those charged extra for *gout*, only 32 per 1000 died from tubercular diseases, while 123 per 1000 died from diseases of 'uncertain seat' (*gout*, cancer, &c.), 264 per 1000 died from diseases of the brain, 129 per 1000 died from diseases of the heart: and of those charged extra for unfavourable personal and family history only 48 and 55 per 1000 died from diseases of 'uncertain seat,' while 156 and 218 per 1000 died from tubercular diseases; 169 and 182 per 1000 died from diseases of the brain; 90 and 73 per 1000 from diseases of the heart, &c.; 163 and 145 per 1000 died from diseases of the lungs; 128 and 218 per 1000 died from diseases of the stomach and liver." Other important information on the mortality of diseased lives in a series of English offices, and in some offices specially cultivating this branch of business, is also abstracted at considerable length in this valuable article.

This fact of the much greater mortality in assurers "without profits" is a remarkable one, as illustrating what seems to be the constant tendency to a process of selection going on against the companies, which calls for every stringency of medical examination. This, by the way, is here said to vary in efficiency

according as it is carried out by the company's officer, or by other practitioners. But the existence of these "secret motives," and their apparently potent influence, seem to add weight to a suggestion which we have heard thrown out by an influential insurance authority in this city, but which we were not aware, till we saw it in this cyclopædia, had been openly promulgated and discussed. In the *Deutsche Versicherungs Zeitung*, 1872 (Art. DISEASED LIVES: Insurance of, Points in practice), there is a proposal to make insurances on the express understanding that the policy is void if death happens directly or indirectly from a specified disease to which the proposer is supposed to be liable, or, extending the plan, from any disease *within five years*: the company in such cases returning the premiums paid without interest and exclusive of their disbursements. Some plan of this kind might meet the views of many people who, it may be, dislike to set themselves to answer the series of somewhat inquisitorial questions proposed by companies, the answering of which may revive many painful, personal, or family recollections or secrets which the insurer does not wish to divulge even to a medical man, much less to have perpetuated in the records of insurance officers. Others who have been declined or regarded, perhaps unjustly, as inferior lives, may be unwilling to propose again, as this question of a previous application is always raised, and it may originally have been raised simply on account of the full and candid answers given to the questions asked. Such persons may be perfectly conscious that others avoid difficulties simply by a suppression of facts. It would remain for discussion to what extent the examination could be thus safely dispensed with: probably a simple personal examination by the medical officer, without any questions formally answered, would be required; but it is admitted on all hands, and is confirmed by statistical evidence, that the benefit of medical selection, as securing a lower mortality among the insured than among the general population, although very great at the time of acceptance, rapidly diminishes in the course of the first few years, so that at the end of five years the advantage of selection is comparatively small. The actual conditions as to returning whole or part of the premiums, &c., would require careful attention from competent parties. It is evident that such a method would not only abolish altogether the most serious losses (within five years) arising from errors in the medical selection, from imperfect examination, or false replies, but it would also exclude some of the serious but legitimate risks to which the most select lives are liable; and so pro-

bably very favourable terms might be conceded as to the return of whole or part of the premiums in the event of death within the term of probation. An important point would be that the financial terms should be such as to enlist in the interest of the society those "secret motives" which have been shown to be so potent as determining the greater mortality of insurers "without profits." There can be no doubt that the very strict inquiries of some offices tend to the development of false returns, not only in the replies of the proposer, but even, perhaps, to a somewhat equivocal nomenclature of fatal diseases—bronchitis being a better name among the insuring class for one's brother or sister to die under than the dreaded name of consumption. Such a development of erroneous information secures the defeat of strict inquiry among the unscrupulous, and tends to keep away or impose hard conditions on the scrupulously truthful, whose doctors (less learned, perhaps, than some in the mystification of insurance companies) may rather have gloried in terrible names for trivial as well as fatal ailments. The above idea of insurance on probation "we commend," as Mr Walford does, "to the consideration of our readers."

We had intended in this review to call attention to the current practice of Insurance Companies in charging female lives at the same rate as males, under the idea, apparently, that, as female life is slightly superior to male, they are thus obtaining a small advantage. While the fact of an advantage for females *as a whole class* is quite clearly established, the child-bearing age with them is obviously attended with such special dangers, that it seems to us that in the insurance of a female, at this period, there is really a higher and not a lower risk. In this connection we have to refer to the articles on CHILD-BIRTH, *Risk of*; and to the articles on ENGLISH LIFE TABLE NO. 3 (Dr Farr's). The difficulty of bringing out the facts by statistics is no doubt considerable—the probability of error in the ages of females in the census returns being well known—but we have such confidence in the judgment of Dr Farr, that we feel very much inclined to adopt without hesitation the opinion he has arrived at after full consideration of all the possible fallacies. He says: "The rates of female mortality are in singular accordance with those deducible from observation on males; *the mortality of females being slightly higher at the ages 10 to 35 than the mortality of males at home in England.*" The diverse opinions on this subject are represented at considerable length in the above-named articles, and we presume the

question will be further discussed under FEMALE MORTALITY, when the work reaches that length.

We need not prolong the notice of this cyclopædia any further. One of our chief aims has been to bring it prominently under the notice of medical readers, as they are very apt to remain in ignorance of such a work, being, as it were, outside of their domain, and the writer outside of their profession. We think, however, that our notice and our extracts (which are all from this work, and not from the original sources) will suffice to indicate the vast amount of interesting matter which lies, in many cases at least, quite ready for us. No doubt, for certain purposes, reference to the originals would be necessary, but it is no small boon to have the materials so fully given and their sources accurately indicated. The solid "blocks" are what we want; the time has not come for safely presenting many of the subjects here treated of in any other form. We notice a somewhat pathetic remark in the preface to the first number; the work, the author says, "has cost me many sacrifices—pecuniary, social, personal, health. I shall find content in any small rewards that flow from it." We can readily believe that the sacrifices in such an undertaking must have been great. We hope that one of the small rewards that will flow from it will be that the work may find its place as a cyclopædia for reference in all our medical libraries.

II.—THE PATHOLOGICAL ANATOMY OF THE NERVOUS CENTRES. By EDWARD LONG FOX, M.D., F.R.C.P., *Physician to the Bristol Royal Infirmary, &c., &c.* With Illustrations. London: Smith, Elder & Co. 1874. Pp. 400.

THIS book is an expression of the tendency which has been exhibited of late years, to refer all functional diseases of the nervous system to definite structural changes. The modern position can hardly be more forcibly expressed than in the words of our author—"Well, that leads me to ask a question peculiarly important in the consideration of nervous diseases; is it possible that any symptom can occur without organic change; or is so-called functional disease a condition that merely leaves no apparent alteration of structure *post mortem*? Even in these nervous diseases, and they are the most difficult of all, you will be right in assuming that morbid phenomena are invariably associated with organic change, but that in a number of cases this organic change is not of a nature to persist after death," pp. 176-77.

We ascribe this book, therefore, to the desire which exists at present among workers in nervous pathology, to refer all which has hitherto been considered functional disorder to some organic basis. Such conditions as delirium, insanity in its various forms, epilepsy, tetanus, &c., are all treated of here from the point of view of pathological anatomy, and the special student of these subjects will find in Dr Fox's work a good compendium of what has been done in this direction. Under these specific heads the author makes a distinct and sometimes a successful attempt to refer the particular affection to its special form of lesion. And, we may further add, it is an expression of the early stage at which this kind of research has yet arrived, that the pathological conditions described are often sufficiently indefinite, and are for different affections often strikingly similar. Thus, in speaking of insanity in its general sense, including such diverse conditions as mania, melancholia, and general paralysis, he says:—"Although we may somewhat cavil at the universality of Rindfleisch's dictum, that we must concentrate our attention almost entirely on a chronic hyperæmia of the cortical substance as the common foundation of all further mischief, yet a very considerable amount of recognisable lesion in insanity is connected with the vessels," p. 179.

Dr Fox has illustrated his work by a series of very carefully executed coloured engravings. These are chiefly from microscopic sections of nervous tissues, apparently hardened and mounted according to Lockhart Clarke's method. We say that this is apparently the case, but we can only judge of it by our previous knowledge of the appearances presented by such specimens. The author gives no indication of the method in which his sections have been prepared, and we find in the text the briefest possible reference to the illustrative engravings. Thus, the first of the plates is labelled "Myelitis, swollen nerve-fibres," and in the text the only reference to it is, "Plate 3 is an example of myelitis following fracture of the bodies of some of the vertebrae and consequent hæmorrhage." It may be stated, generally, that we miss in this volume that careful description of appearances and that definite illustration even of the simpler phenomena which we had expected. It is much too indefinite, and appears to be written rather for those who are already exceedingly familiar with the subject. As perhaps the number of persons in this happy condition is in this country very limited, and as these are hardly in need of such an elaborate elucidation, and as, finally, the book is addressed to students, we think we were warranted in expecting something more directly instructive.

There is another point in which we must take exception to Dr Fox's book, and that is his arrangement. In a general text-book of Pathological Anatomy, it is perhaps expedient to consider, first, the various general diseases, inflammation, tumours, and so forth, and then proceeding to the various organs and systems, there take up the individual diseases. There are some who are opposed to this method, even in a general work on Pathological Anatomy—and the excellent work of Klebs has no general part, but enters at once on the individual parts of the organism, and describes the diseases as occurring there. But if the method is in any way doubtful where the whole subject is under consideration, it is surely much more than doubtful where only a department of it is the subject of discussion. We, therefore, seriously object to the arrangement which the author describes as follows:—"It is proposed to divide the subject into two parts; and, first, to describe the pathological anatomy of the brain and spinal cord; and, secondly, the mode in which these pathological results are grouped in certain conditions, which symptomatically have been given special names, as mania, melancholia, &c." The author himself sees that this is an illogical division; there seems no reason for placing tumours in the first section, any more than the second, for surely tumours of the brain have symptoms which enable us in some degree to group them classically under one head. The division adopted has, in fact, caused considerable repetition and confusion, and has produced, so far as we can see, very little good in return.

We can only conclude by commending the work to the careful consideration of all who are specially interested in this group of diseases.

III.—ON THE FUNCTIONAL DERANGEMENTS OF THE LIVER, *being the Croonian Lectures delivered at the Royal College of Physicians, in March, 1874*, By CHARLES MURCHISON, M.D., LL.D., F.R.S., &c., &c. London: Smith, Elder & Co. 1874.

WE can imagine some literary dyspeptic, for years perhaps a "martyr to his liver," as he has been told or believes, procuring a copy of Dr Murchison's valuable treatise on *Diseases of the Liver*, published a few years ago, with the view of "reading up" his complaint. But amidst the fearful array of diseases therein discussed, with the doubtful exception of the first chapter on congestion of the liver, he would find little or nothing bearing on his particular case, and after glancing at

the dissertations on Hydatids, Cancer, Jaundice, and Dropsy, he would dismiss the book with a feeling of thankfulness that it referred to those who had more serious troubles than any from which he, as yet, suffered. Such an one should procure these Croonian lectures, if he wishes to console himself with the thought that he really has hepatic disorder. For if 9 persons out of 10 (outside of hospitals), who are said to suffer from their livers, would find but little encouragement in Dr Murchison's *first* book for this belief, 9 persons out of 10, suffering from almost any ailment whatever, would find in this *second* treatise ample justification for the idea that no small part of their symptoms might be referred to a "derangement of the liver." It is so easy to assert that the liver is out of order, and so difficult to prove such assertions erroneous, that this diagnosis had become as prevalent, and we may add, as unsatisfactory, as "teething" in children, or "change of life" in women. In the reaction which set in among more careful physicians against such reckless diagnosis, the slighter disorders of the liver have been perhaps of late somewhat ignored, and some of the multitudinous complaints referred to this organ have rather been spoken of as due to errors in the digestive functions, among which, of course, the function of the liver was more or less distinctly included as an important element.

The progress of physiology had long made us familiar with the great value of the biliary secretion as preparing pabulum for the blood (although the importance of the interchange thus constantly going on, by the secretion and re-absorption of fluids in the digestive tract, scarcely received the attention it deserved), and so the liver has long been regarded as fulfilling a nobler function than the mere secretion of a bile to stimulate the action of the bowels. But of late years pathology, experiment, and clinical observation, have shown the close connection of derangement in the hepatic functions with diabetes, and various other disorders associated with urinary disturbances, such as renal calculus and urinary sediments; while a strong conviction has been arising that this large gland has much to do with the formation of urea, and the development of animal heat. Founding upon these and similar recent advances, Dr Murchison seeks to re-instate the liver as one of the great regulators of health, and to bridge over the gulf which seems to separate scientific medicine from the routine prescription of blue pills and seidlitz powders for the popular "biliousness." The outcome of the work is very much to confirm the popular traditions respecting the

value of mercurials and salines, and the evil of over-eating, over-drinking, and deficient exercise, and the special danger of fashionable dinners, malt liquors, and champagne.

Founding on the connection of urinary sediments (lithates) with deranged liver, he describes a blood poison—lithæmia—allied to gout, although distinct from it, which is capable of poisoning and deranging nearly every function of the body. It is this comprehensiveness which somewhat alarms us: here is a bare catalogue:—

Corpulence, emaciation, diabetes, gout, urinary calculi, biliary calculi, degenerations of the kidney, deranged appetite, flatulence, constipation, diarrhœa, intestinal hæmorrhage, hæmorrhoids, jaundice, aching in limbs and shoulder, neuralgia, cramps, headache, vertigo and dimness of sight, convulsions, paralysis, noises in ears, sleeplessness, depression of spirits, irritability of temper, palpitations, irregularities and intermissions of the pulse, anæmia, angina pectoris, bronchitis, spasmodic asthma, deposits in urine, renal calculi, diseases of kidneys, cystitis, eczema, urticaria, boils, pigment spots, &c., and even cancer (see page 82.)

On reading over such a list, one is almost irresistibly reminded of the catalogues of disorders in quack advertisements, and the marvellous pills and skillful doctors whose treatment can cure all the ailments they enumerate; but if, as they say, they “correct the liver,” it would seem the miscellaneous disorders advertised by them are not so unscientifically arranged as we usually suppose.

It seems to us that Dr Murchison rather overdoes his case. The liver he shows to be connected with sanguification and the disintegration of albuminous matter; and its disordered function may naturally be expected to show itself in disorders of these. He then enumerates many disorders of these two functions, but we must remember that other important organs may also be concerned in both processes, and disorders in their functions may be responsible for many of the above symptoms. Why may not the spleen be credited, or rather debited, with a share of the above disagreeable derangements—at least, let us say, in proportion to its weight? Of course no one sees more clearly than Dr Murchison the deficiencies in the connection which he seeks to establish between many of the symptoms named and disorder of the functions of the liver. He deserves great credit for the masterly manner in which he has gathered up the immense mass of loose and vague floating medical tradition and

observation on this subject, almost impressing a scientific precision upon it. These lectures serve to sketch out the plan by which more definite observations may be made on this obscure and often intangible subject, so that we may hope in time to have reliable data to go upon in the diagnosis of functional as well as serious structural diseases of the liver. We need scarcely say that there is here, as in all Dr Murchison's writings, much valuable practical information on the subject of treatment, and especially on that important part of it, the question of eating and drinking, with all which we perfectly agree. These lectures, however, have been already so widely read and appreciated that we need not extract these passages, or prolong our notice of this remarkable work.

IV.—NOTES OF DEMONSTRATIONS ON PHYSIOLOGICAL CHEMISTRY. *By* S. W. MOORE, *Joint-Demonstrator of Practical Physiology at St George's Hospital, Medical School, F.R.S., &c.* Smith, Elder & Co., London. Pp. 56.

WITHIN the last few years animal chemistry has reached a stage in which it can be of practical use to the physiologist and practitioner. Until very lately, it may be said to have consisted of a mass of valuable but unconnected observations. Especially do we owe to the patient research of our German fellow-workers, the great advances which have now raised it to something like a definite system. For the student here, however, the scattered papers in which the information is contained, and often the barrier of a foreign language, have generally proved obstacles which his time would not allow him to surmount, even if inclined. But it is rapidly becoming apparent, that if he ever hopes to keep up with the strides his profession is making, he must at least know enough of physiological chemistry to understand what he reads. As yet happily we are not deluged with text books on this subject, and we, therefore, welcome Mr Moore's notes all the more cordially. Indeed, with the exception of the latter part of the practical physiology, edited by Professor Sanderson, we know of no book where the subject is sufficiently condensed, to permit of perusal by the already heavily taxed student, and even here, from the nature of Dr Lauder Brunton's paper, the instruction cannot be given in the systematic manner so advantageous in first studying a subject. Mr Moore's *brochure*, then, is well timed, and very successfully meets what is becoming a much felt want. It consists

of notes of the demonstrations given to his class, and is a model of the condensation and omission which should characterise such a production. Indeed, if any fault is to be found, it is with over-condensation, but this is so uncommon, it is almost a virtue. The author, of course, begins with the assumption that the student has a fair knowledge of ordinary chemistry and laboratory work, and throughout the book shows great judgment in deciding the rather difficult problem of what this means. One exception, indeed, there is in his account of the spectrum, which, we think, could with advantage have been omitted. The use of the spectroscope should be taught practically, and, indeed, is so in every physiological laboratory, and little good is to be derived from three-and-a-half pages of description. A point worthy of notice is the care with which every thing bearing directly on the pathology or treatment of disease is dwelt upon.

The style is perhaps as clear as the necessary condensation will permit, but occasionally is slightly marred by too great trust to punctuation, instead of arrangement. The ordinary physiology of the book is quite up to the most recent researches, and the whole work displays a very complete mastery, not only of the subject treated, but also of the collateral branches, a knowledge of which is so necessary for the success of such a treatise. It is a book from which it is difficult to make characteristic extracts, but the following will give a fair idea of the style and kind of information contained in it. Speaking of blood and its coagulation, he says:—

“The formation of *fibrin* is said to be due to the combination of two kinds of albumin, termed respectively fibrinoplastic and fibrinogenic substances; the former is identical with paraglobulin, and is precipitated from solution by carbonic acid; when added to a fluid which contains fibrinogenic matter, such as hydrocele fluid, fibrin is formed; fibrinogenic substance can be obtained from its solution by saturating with chloride of sodium, collecting the precipitate, and dissolving in distilled water.”

Nothing could be shorter and clearer than this account of a process which we have known some students have difficulty in understanding. Altogether, we commend the book to our readers, especially to those whose time or tastes do not permit the perusal of the more ambitious works upon the subject.

V.—OUTLINES OF THE SCIENCE AND PRACTICE OF MEDICINE. By WILLIAM AITKEN, M.D., F.R.S., *Professor of Pathology in the Army Medical School.* London: Charles Griffin & Co. 1874.

WE are quite conscious of the great benefits to be derived from a well-executed handbook of Medicine, and yet we must confess to have long looked on such guides with a certain degree of distrust. From their very nature they involve a limited, and at the same time dogmatic, statement of many points which are still *sub judice*, and we are aware that many students instead of making them mere finger posts to the systematic works on the subjects of which they treat, or rendering them subservient to thorough clinical investigation, are too apt to adopt them as their sole guides to the practice of Medicine, and at the very outset of their career imbibe crude and often erroneous ideas on questions of the most vital import. These handbooks, however, are indispensable, and Dr Aitken's work is the last in the field.

In his preface to the "Outlines" he says they may serve as an introduction to his large work on Medicine. It is only in this light they can be valuable to the junior student, although for the more advanced student they form a very well-digested epitome of the larger work. The book is divided into three parts—the two first treating of the more general subjects, and the last dealing with special diseases and their therapeutics. He devotes 30 pages to a detailed description of case-taking. It might have been dismissed with advantage in much shorter space; not that it is unimportant, for the student must, of necessity, have some general rules to guide him, but the minute details of case-taking may be left with great advantage to the clinical teacher and the student himself. The remarks on the principles which guide the treatment of fever are based on Murchison's classical work, and are terse and clear; but we think it a pity that this chapter should have been placed in the first part of the work, quite detached from the detailed description of the fevers. This fault is, however, remedied to some extent by references.

It is with the third part of the work that we are especially pleased. It is admirable in most respects, for although there are several important omissions, such as the treatment of aneurism by galvano-puncture, and of angina pectoris by nitrite of amyl, still, on the whole, the treatment and the description of the diseases are well up to the present day. The chapter devoted to the *Physical Examination of the Chest* is as nearly perfect as the circumstances will permit; and the *Diseases of the Heart and Lungs* are shortly, but admirably, given. Too little space has been devoted to the fevers, and the diseases of the eye might have been somewhat curtailed. In his treatment, Dr Aitken fully re-

cognises the fact, and seeks to impress it on his readers, that it is absolutely necessary to treat every case on its own merits, and not follow any routine practice. This is wise, and it is a most essential element in the student's training.

One or two of the chapters are somewhat unequal in execution, and there are several fundamental errors. Thus: at page 579, when treating of *Alcoholism* and *Delirium Tremens*, he says, "The disease has been variously named the *brain fever of drunkards*, *dipsomania*, or *delirium tremens*." We know of no author who regards *dipsomania* and *delirium tremens* as synonymous terms. *Dipsomania* is spelt in the index with a *y* in defiance of its etymology, but in the text it is correctly given. Too little attention is bestowed on ætiology. The get-up of the book is good, and we can honestly recommend it as a useful index to the larger works on Medicine. It is dedicated to Professor Allen Thomson, whose assistant Dr Aitken formerly was.

- VI.—1. THE QUESTIONS OF AURAL SURGERY. *By* JAMES HUNTER, *Aural Surgeon to Guy's Hospital*. London: Henry S. King & Co., 1874.
 2. AN ATLAS OF DISEASES OF THE MEMBRANA TYMPANI. One hundred and fifty Drawings by hand, with Descriptive Text. Crown 8vo. London: Henry S. King & Co., 1874.

For a period of ten years after the issue of Toynbee's celebrated work "On the Diseases of the Ear," viz., from 1860 to 1870, English otologists were singularly unproductive in regard to the literature of their speciality. Compared with the numerous, and, upon the whole, substantial, contributions to aural science which were made by our Continental (European and American) confrères in that period, we here in England, to all appearance, had done little or nothing. To account for the productiveness of our foreign brethren, and our own barrenness, in the period above named, is not a difficult task to any one who looks beneath the surface of medical things as they existed then, and to a very large extent still exist among us. To enter fully into this subject is not consistent with the object of this notice, and we therefore leave it with one or two general remarks. A State which allows no idler to claim or hold its honours, and which demands exhaustive and original work from those to whom it extends its patronage, must outstrip, in every respect, that State in which scientific investigation is left to individual effort, unencouraged and almost unrecognised. In the former, specialism, in all departments of science, is fostered and encouraged, and the sum of knowledge increased: in the latter

necessity too often compels the scientific worker to scatter his energies without increasing his productiveness, and to specialism in any form there is begotten a deep-rooted aversion. The specialist produces, the non-specialist reproduces.

Had the unproductiveness of English aurists above noticed continued to the present time, it is not too much to say that English aural surgery must have ceased to be. Happily it did not continue, and, notwithstanding the assertion of a recent writer, the works now before us afford sufficient proof of this.

With the advent of 1870, a spirit of activity had seized English aural surgeons, in striking contrast with their previous ten years' apathy. Hinton—than whom no one was better fitted to emulate the great achievements of Toynbee—contributed in this year to Holmes' "System of Surgery" the article, "On the Disease of the Ear," which, besides being the best and most succinct essay extant on the subject, is quite characteristic of the writer, who knew so well what to say, and how to say it. In 1871 Allan issued his "Aural Catarrh"—a small work, which could not possibly influence, in any way, the position of this speciality. In 1872 nothing but ephemeral contributions appeared, some of them giving evidence, however, of careful observation on the part of their writers. In 1873 we had quite a rush of works, which we have already noticed in these pages, and need not now even name. With 1874 British aural surgery seemed to leap at once to the front rank, the place it held, and worthily held, in times gone by, but from which temporarily it had somewhat fallen, at least in the eyes of English aural surgeons. The impetus thus given to it was caused by the appearance of the two remarkable works by Hinton, the titles of which are given above. The excellence of these works proves how well their author represented British aural surgery, and how difficult it will be, since he has retired, to find a successor to his position, fitted as he was, in every respect, to sustain undiminished the lustre and traditions of the school founded by Saunders, Toynbee, and Wilde. Till these works appeared, one could have said, with justice, of this school what had been said of Scotch philosophy, that it was esteemed abroad, and unrecognised, as well as unrepresented, at home. Happily this accusation is no longer possible.

I.—"The Questions of Aural Surgery," and the "Atlas," are, to some extent, mutually illustrative, yet independent of each other. For this latter reason we prefer to speak of them separately, an arrangement that will enable us to do them greater justice. The former work, which is truly not a text-book, at all, but a series of exhaustive clinical essays on diseases

of the ear, appeals apparently rather to the student of this department of medical science than to the busy general practitioner of medicine, to whom it may at first sight prove rather disappointing. If, however, he is tempted to study its pages—and we heartily commend them to his notice—and is thoroughly *en rapport* with the style and spirit of its author, he will realise how important this department is, and how necessary it is that he should not remain in ignorance concerning it. The specialist, on the other hand, cannot fail to see that the whole of his speciality is considered, and its limits compassed in its pages; while both will be charmed with the strictly scientific style in which it is written, and the modest tone and candour of its author.

The introductory chapter is occupied by general remarks upon the form and structure of the ear, and the physiology of its respective parts. The experiments of Flourens, Czermak, Helmholtz, Politzer, Böttcher, Rüdinger, Löwenberg, and others, and the pathological observations of Hasse, Magnus, Hughlings Jackson, and Cassells, are recognised, and their value candidly estimated in relation to the function of the several parts of the organ.

The chapter on diagnosis is, we think, the most valuable one in the volume, and perhaps the most characteristic of the author's style. In it the methods and instruments necessary for the examination and diagnosis of the diseases of the different parts of the ear are described, and the general history of the patient considered in relation to the local disease. This part of the examination our author defers till the nature of the local affection has been ascertained, for the reason that "many of the causes of deafness are exclusively local." We agree with him in this arrangement, even though it is contrary to recognised practice. The investigation of any given local affection, is, we think, always suggestive of questions that otherwise might escape the examiner; at any rate, it can never supersede a careful examination into the history of the patient, in the hands of a painstaking surgeon. In regard to the use and value of the Eustachian catheter, the author hardly estimates it at its fullest worth when he says that "it is not often requisite for purposes of diagnosis." It is probably the fact, that his great experience and tact enabled him to dispense with it in many cases without marring the success of their after treatment; if so, the opinion which he has expressed is quite justifiable. But such qualifications are not possessed by all who are called upon to diagnose and treat ear diseases. We regret, therefore, that he has so expressed himself in regard to this instrument, and all the more

in that he values, for diagnosis, the sounds heard during auscultation of the ear, by the passing of air through the Eustachian canal, as second only to the results obtained by an examination of the membrana tympani; and that there are numerous cases in which that can only be accomplished by the aid of the catheter.

Among the general diseases affecting the ear, Hinton lays the greatest stress upon the exanthemata, and, indeed, fevers generally, a position in which he is supported by common experience. The gouty diathesis, we agree with him, seems rather to produce an obstinacy of the ordinary diseases of the organ, and not specially characteristic symptoms, although we are disposed to say that this cachexia is one of the chief factors in the production, if, indeed, it is not the sole cause, of that peculiar form of post-nasal and pharyngeal katarrh, which is met with in patients in whom this habit of body is well marked. Concerning the rôle which syphilis (hereditary and acquired) plays in the production of aural disease, our author says, "It has a certain part in aural disease, but how large a part is not yet decided." Our own experience would entitle us to say, that it plays a very large part indeed at all periods of life, and we feel satisfied that such a keen-sighted observer as he is would agree with us when we say that, in the causation of ear disease and deaf-mutism, it is second only to the exanthemata. Nor is this syphilitic ear disease confined to the poorer classes, as might be supposed; on the contrary, it is found unpleasantly frequent among the better circumstanced in society, in the form of deficient nerve power, manifesting itself by defective hearing, keratitis, "Hutcherson's" teeth, adenoid pharyngitis, and the peculiar *physique* of this diathesis.

"The convulsive affections of children stand in a most important relation to ear disease." In this we thoroughly agree with the author, for, apart from the more obscure affections of the labyrinth which cause such convulsive seizures, not a few cases are due to pressure of fluid within the tympanum, and which, despite the heroic measures wont to be used, remain unrelieved and unexplained, till the occurrence of a discharge of pus from the meatus dispels the mystery and effects a cure. This chapter concludes by noticing the frequent dependence of inflammatory affections of the ear upon diseased teeth; the influence of the Indian climate; the poison of ague; the effects of quinine; overwork; exhaustion; over-lactation; depressing emotions; and the relationship of parents in the causation of ear disease. The bearings of these latter questions are, however, suggested to the student for examination, rather than solved by the author.

The chapter treating of diseases of the auricle and external meatus is very exhaustive, but we can only find space to notice one or two points. In speaking of the removal of foreign bodies from the meatus, our author's counsel is the outcome of ripe experience, and, as such, deserves to be pondered by every one who follows our calling, be he specialist or general practitioner. He says, "It should always be borne in mind that there is one, and but one, great danger; the danger lest the surgeon should suffer himself to be drawn on into hurtful efforts at extraction. No one who remembers how great is the difficulty of abandoning a seemingly simple task, in which he finds unexpected difficulties, probably under the eyes of anxious friends, before whom an apparent failure will be intolerable, will suffer himself to take up any instrument for the removal of a foreign body from the ear, until after the most patient efforts to avoid it, and the most serious consideration of its absolute necessity. I must be pardoned for speaking earnestly on this point. Even to this day it remains the fact that ears are thus destroyed without shadow of reason or excuse, and not by careless or incompetent persons alone." As to the means of effecting the removal of a foreign body from the meatus, he recommends syringing, and "that when proper syringing will not succeed, all instruments are full of danger." *Proper* syringing, we may remark, seldom fails to effect the removal of a foreign body, but where it does, other simple expedients may be tried—such as the Löwenberg, the Clarke, or Clelland methods—before having recourse to an instrument.

The chapter on affections of the Eustachian tube is one of more than ordinary interest at the present time. The anatomico-physiological investigations are particularly deserving of study; especially do we commend the experiments of Yuile to the consideration of those who talk about freeing the Eustachian canal from obstruction, by "forcing" air into it during the act of deglutition with the anterior orifices of the nares closed.

Among the affections of the *Membrana tympani*, independent of disease in the other structures, he speaks of a "more than customary thinness and transparence of the membrane," as found to exist in persons in whom "the auditory nerve is impaired in unexplained ways." This coincides, upon the whole, with our own experience, but we have met with several cases in which the membrane was unusually thin, as well as transparent, without any defect in the nerve. For a time these cases were a puzzle to us; at last, however, the mystery surrounding them was cleared up. These patients generally had a history of frequent attacks of throat affection. On examination, besides having this

confirmed by the condition of the naso-pharyngeal mucous membrane, there was always found much chronic katarrh of the pharyngeal extremities of the Eustachian canals as well. The result of this state of matters was, that considerable and gradually increasing impairment of the hearing was complained of; the cause and its manner of operation in producing the deafness being quite obvious to a trained observer.

In nearly every such case, in consequence of their experience that good but temporary hearing followed either what they called a "crack in the ear," or violent blowing of the nose, they had learned to force air into the tympana with that object. This practice, successful no doubt at the time, when long continued, resulted in a relaxation and atrophy of the whole membrane, especially of the fibrous lamina, and deafness of a kind not easily remedied, even after removal of the diseased condition of the throat and tubes. The cause of the defective hearing, in these cases, lay not in the nerve, but in the membrana tympani, which was so changed in structure as to be no longer able to afford the normal tension to the contents of the labyrinth. That this inference was correct, was shown by the improvement in hearing which followed the application of well-directed support to the weakened structure. The Valsalvian method of inflation (for it was this proceeding which these patients had performed) is valuable as a diagnostic means, and as a therapeutic remedy in certain cases is not to be despised; but in this connection we would caution against its indiscriminate use. The late Tom Spring is said to have given a recipe to make a crooked spine: were we asked to give instructions to produce deafness, we would say—Observe all the ordinary rules of health, but blow into your ears strongly once daily for a year. We saw a lady in Heidelberg, who had for three years industriously blown air into her ears in the manner spoken of above. Her deafness, mainly due to this proceeding, was incurable.

We place a higher value upon the diagnostic import of deposits of cretaceous matter between the layers of this membrane than our author is disposed to do. Doubtless, as he says, extensive deposits are often found with perfect function. We have seen the greater part of the membrane converted into a chalky plate, without any discoverable loss of hearing, but far more frequently, as pathological investigation has taught us, such deposits are associated with similar ones within the tympanum, and on the scalæ of the cochlea.

In all cases, cretaceous deposits on the membrane are evidence of a degeneration, and often there is unmistakable evidence that the diathesis is syphilitic. At any rate, we cannot

at present call to mind a case of this nature as occurring in a well marked gouty habit, not even where copious deposits of urate of soda could be seen and felt in the helix and meatus.

We must pass over much that is interesting, not however without calling attention to the habit of boxing children's ears, which prevails to a large extent in every class of society. "Probably no more cruel injustice is done than that which is inflicted in boxing children's ears for inattention." "Children are not inattentive, but distinctly curious and alert, and a child who incurs boxes on the ears on such ground is probably doubly injured—in mind as well as body—by the injustice, as well as the hurtfulness of the blow." The greatest sinners in this respect, in the present day, are school teachers.

Concerning the resisting power of the *membrana tympani*, we are quite unable to reconcile our experience with the results of the experiments of Gruber. He found the membrane to resist a force equal to the pressure of four atmospheres, *without rupturing*; indeed, using all the force he was capable of exerting with a syringe fitting tightly into the meatus, he never succeeded in rupturing this membrane. Our experience shows that a well-directed blow, *by no means violent*, ruptures the membrane readily, and that sudden condensation of the column of air in the meatus caused by taking "a header" into the sea produces a similar injury. It is interesting to note the provision made in the form of the organ of hearing in fishes, and some amphibia, to prevent injury from pressure while under water. The narrow tortuous meatus in nearly all, the externally convex *membrana tympani* in many, and the special valvular arrangement at the orifice of the meatus of the whale are means to this end.

The sixth and four following chapters in the work are, so far at least as its author is concerned, of the highest importance. In them he appears to best advantage as a finished clinical student: neither dogmatising nor hastily claiming results, confessing his mistakes, and admitting his failures, he stands out in these pages as a model clinical teacher. In these chapters the various forms of acute and chronic katarrh, and their consequences—viz., suppuration, accumulations of mucus, perforations, polypi, collapse and rigidity of the membrane, adhesions, ankylosis, etc., are most exhaustively dealt with. It was in the treatment of this disease, especially in its chronic form, that the author's originality was most conspicuous. In the treatment of the acute stage of tympanitis, being doubtful of its advantages, he does not favour early incision. In speaking as he does on this point, we cannot but admire his candour, while we regret that he did not, by a more extended trial, decide for or

against the operation. The perfection of the practice of aural medicine and surgery lies in the measures which it places at our disposal being recognised and utilised in the prevention, rather than in the cure, of the diseases of the ear. If this principle be accepted, then we claim to say of early incision of the membrane, in the disease in question (whether idiopathic or specific), that it is the perfection of aural surgery. Further, inasmuch as it is preservative of tissues upon whose integrity normal function depends, it is a perfect example of conservative surgery. Early incision of tissues is, in truth, the foundation of conservative aural surgery.

While holding this position in regard to simple acute katarrh, we are gratified to notice that he insists on the necessity of free and early incision of the membrane in cases in which, during the progress of one or other of the exanthemata, the tympanum becomes involved. He has, however, overlooked the fact that the proposal to do so emanated, in the first place, from Saunders (1802), who with justice may be styled the father of British aural surgery. On the necessity of early and frequent examination of the ears in cases of measles, scarlatina, and whooping, cough, he especially insists, for the reasons "that much less permanent deafness, even less deaf-mutism, will affect the people, when the profession make it part of their duty to study the condition of the tympanum" in these diseases, and "that the mortality, at least from scarlatina, might be appreciably diminished by treatment directed to the ear." With all this we heartily agree. As we have already said, the treatment of cases of chronic katarrh, in which the loss of function was due to accumulations of partially inspissated mucus in the tympanum, is of special interest, because of the originality of the author's conception as to the nature of these cases, and the boldness with which he carried out their treatment.

Regarding these accumulations of mucus as lying, not at the bottom of the cavity of the tympanum, where one would most naturally expect to find them, but clinging around the ossicular chain, Hinton conceived the plan of the high operation of parakentesis, and of forcibly passing an alkaline solution through the tympanum by this incision, in order to effect the removal of the accumulated mucus. The success which followed this method of treatment was to him a rich reward for the anxiety he underwent in dealing with cases otherwise beyond the help of art. But success did not always attend these efforts. "Of course I have failed many times, and often have selected my cases injudiciously. I believe, also, it is quite possible that I may, in several cases, have diminished, instead of increasing, the

hearing." "But I have failed even in cases in which I fully expected to succeed, and I don't know the reason;" nor do we. If unsurpassed experience in the diagnosis of such cases gave grounds to hope for success in their treatment, the author, of all men, was best entitled to look forward to such an issue. But failure he confesses without disappointment, regretting only the lack of a more precise knowledge of the pathological state of the cases he failed to benefit. There is much that is interesting in regard to the consequences of katarrh of the tympanum, and we should have much liked to have noticed one or two points; but we cannot, because of the length to which our notice has already extended.

In the chapter on disease of the ear in children, we can only notice that peculiar affection, not seldom met with, the true significance of which has yet to be determined (first noticed carefully by Voltolini), in which the symptoms are, that the child has an attack of smart fever, with anomalous head symptoms, similar to meningitis. In a few days these all disappear, the child recovering consciousness, but remaining permanently deaf. What the pathology of these cases may be we do not feel ourselves in a position to say, because an opportunity seldom occurs of ascertaining by more accurate examination the nature of the lesion. The tympanum does not appear to be the seat of the mischief, and it would be difficult to affirm, in the absence of positive evidence, that it is in the meninges; while the fact that many of these patients hear transmitted tones, makes it equally difficult for one to believe that it can be in the cochlea *alone*. No class of ear affections so excite our sympathy for the patient. The fate of the little one who awakes to consciousness and to a world in which, for him, there is no sound, is a sad one indeed, and calls forth our tenderest commiseration. Let us hope that the advance of science may remove from our treatment the helplessness which, in the majority of cases, has till now characterised it.

The remaining chapters of the work are taken up with such subjects as affections of the brain, resulting from ear disease; affections of the muscles of the Eustachian tube; electricity in the treatment of ear disease; nerve-deafness; hereditary syphilis; and, the climate of India in the causation of ear affections. We again express our regret that want of space enables us only to name these subjects. We can say, however, that they are treated with the well-known ability of the author, whose great and varied experience served to cast light upon questions which must have otherwise, for a time at least, remained in obscurity, or altogether unexplained. In conclusion, we com-

mend the book to our brethren in general practice, as one teeming with valuable information, which cannot fail to be of use at some time or other. The specialist who has not read, and, if we may use the word, assimilated it, is in the blackness and darkness of night in respect to his knowledge of aural surgery.

2.—The "Atlas of the Membrana Tympani," by the author of the preceding volume, is a remarkable work, both in its conception and execution. To conceive of giving *hand drawings* of the diseases of this membrane was bold, but to carry the conception to a successful termination, as Hinton has done in this Atlas, is simply wonderful. To those who thoroughly comprehend *all* the difficulties surrounding such a task, the wonder is increased. To give some slight idea of the labour involved, we may state that each volume is made up of twenty-five plates, each plate giving six distinct representations—altogether, 150 drawings of the membrana tympani, illustrative of its various diseased states. The originals of these drawings were *all hand-painted*, in water colours, from the *living* subject. From these, in turn, were copied the drawings which form *each* Atlas. We know that each drawing of the original set was carefully compared with the case of disease it was intended to represent, while all the copies made from them were passed under the watchful scrutiny of the author, again and again. Need we say that success under these conditions was certain? Further, when we mention that all the drawings in each copy of the Atlas are *hand-painted*, in water colour, no one, we are sure, can feel surprised at the cost of it, or the comparative smallness of the number (50 copies) issued.

The drawings composing this Atlas are finished in the highest style of art, certainly not surpassed by the finest miniature we have seen, and simply as a work of art, it leaves nothing to be desired, yet faithfulness to nature has not been sacrificed. The minute accuracy of these drawings is great as the collection is artistic. We can do little more than draw attention here to one or two plates of unusual merit and interest. In the first plate, for instance, the drawings numbered respectively 1 and 2 deserve especial commendation. The former represents the membrana tympani in a normal condition: the latter as unusually thin and transparent. Until now we have never seen a successful drawing of the healthy membrane.

In the third plate most accurate drawings are given of the membrane in the various stages of Eustachian obstruction. The successive steps from slight abnormal concavity to complete collapse of this structure, are correctly shown. In plates 4 and 5 every kind of perforation is illustrated. The figures of multiple-perforations are especially worthy of study: as also in plate 8

"perforations healing." In plate 20 there are two capital figures of exostoses of the external auditory meatus.

In conclusion, we beg to thank the author of these works for the instruction and pleasure he has afforded us in noticing these his parting gifts to aural medicine and surgery.

VII.—A PRACTICAL TREATISE UPON ECZEMA, INCLUDING ITS LICHENOUS AND IMPETIGINOUS FORMS. By Dr M'CALL ANDERSON, *Professor of Clinical Medicine in the University of Glasgow, &c., &c.* Third Edition. With Illustrations. London: J. & A. Churchill. 1874.

A WORK which, like the one before us, has reached the third edition, must be possessed of some good qualities which have recommended it to its readers, and may now be permitted to escape that searching criticism which, most fairly, awaited it on its first appearance. The attention of one acquainted with the book is, indeed, chiefly engaged with the observation of the improvements or alterations which have been made since the last edition, and with the modifications evident in the views entertained by its author. In the latter respect the new edition of Dr Anderson's "Eczema" presents few points of interest; for, excepting that the author is now prepared to admit that the disease may be slightly contagious, and that the season of the year and certain conditions of heat and cold do affect its occurrence and continuance, we notice no such changes. But while so little alteration has been found necessary, the additions are both numerous and lengthy, as may be gathered from the fact that the text of the second edition occupied only 172 pages, while in this one it is extended to 204 pages. The most striking of the additions is a brief, and not very interesting, chapter on the anatomical lesions of Eczema, adapted chiefly from the works of Neumann, Biesiadecki, and Kirdileisch, and illustrated with five excellent wood engravings. The chapters devoted to the consideration of the treatment of the several forms of the disease have received many interesting additions, such as the formula for a cod-liver oil emulsion, paragraphs on the internal administration of strychnine, and of carbolic acid; on the curative effect of vaccination in certain cases of eczema in young children; and, the use of impermeable dressings; together with six or eight more of the elegant formulæ which Dr Anderson is so highly successful in elaborating.

Although the new edition bears many evidences that very great pains have been expended on its production, it yet shows here and there that even more attention to some of the details

of editing would not have been amiss. Thus, we find that while in chapter 2 the fissure is not recognised as a true elementary lesion, but only as a complication (p. 27), it is reproduced in the summary at the beginning of chapter 3 as number five in the list of such lesions. Again, we are sure that the author would be both surprised and amused if a dispenser should label the ointment made according to the prescription at the bottom of page 117, "A most elegant formula;" and yet such is the direction which Dr Anderson gives.

These are, however, very small defects in what is truly a very admirable work; and, in conclusion, we can only wish the author a rapid sale for this brief, lucid, readable and complete treatise on an important subject.

Exchange Journals.

By DR JOSEPH COATS, *Lecturer on Pathology in Glasgow University.*

REICHERT AND DU BOIS-REYMOND'S ARCHIV.

Nos. 5 AND 6. 1873.

CONTENTS.—I. On the galvanic introduction of various fluids into the uninjured living organism, by Hermann Munk. II. On the negative oscillations of the muscular current during contraction, by E. Du Bois-Reymond. III. On the presence of sugar in oedematous fluids, by Dr C. Bock. IV. Studies on megatherium Americanum, by H. Burmeister (Plate XI.). V. Investigations on the gasometry of transudations in man, by C. Anton Ewald. VI. On the arrangement of the jaws of birds, by Dr Chr. Aeby (Plate XII.). VII. Cases of supernumerary ossicles in the inferior row of carpal bones, as representative of the styloid process of the third metacarpal, by W. Gruber. VIII. The occurrence of the ossiculum intermedium carpi in man, by the same. IX. On the nerve-terminations in the greater omentum, by Dr Finkam. X. On the development of the elastic fibres in reticulated cartilage, by Dr R. Deutschmann (Plate XIV.). XI. Contributions on the electric central organ of the torpedo, by M. Reichenheim (Plates XV. and XVI.).

I. The Introduction of Substances through the Skin by means of Galvanism (Munk).—Experiments

having in view the introduction of substances in solution through the uninjured skin, by means of a galvanic current, seem to have been hitherto unsuccessful. The author states that the reason of this want of success is, that the electrolytic action of the current has been called into use, whereas all we want is that the substance should be carried by the cataphoric action of the current to a certain depth through the skin, so that it may there be taken up by the juices of the body, and so absorbed. The author's experiments going on this principle have been successful; and he further remarks that the substance to be absorbed should be placed at both poles of the battery, and that the direction of the current should be reversed at intervals. He experimented on rabbits, and on his own person. In the former he used a solution of strychnia, the absorption of which would be rapidly shown by its physiological action. In experimenting on his own person, he used solutions of quinine and iodide of potassium, the presence of these substances in the urine being evidence of their absorption. He used disc-shaped electrodes, the flat surface, which was in contact with the skin, measuring 10 to 15 millimeters in diameter. In the case of rabbits, he used 10 to 18 Grove's elements; on himself he used 10. He applied the current for fifteen to forty-five minutes, changing the direction every five or ten minutes. He tested the intensity of the current with the Bussola throughout the experiments. The results of his experiments are briefly these—In rabbits, to whose skin a solution of strychnia was applied in the way described, the reflex irritability was distinctly increased in from ten to fifteen minutes. In twenty to twenty-five minutes spontaneous spasms occurred, and these went on increasing as the current was continued. When the animal was set free, the convulsions continued for a time, either terminating in death, or resulting in gradual recovery. There could, therefore, be no doubt that the solution was introduced into the body. In the other set of experiments, the solutions were applied to the author's arm in a similar way, for half-an-hour or fifteen minutes. The quinine and iodide could be detected in the urine for the next twelve hours. The experiments were checked by applying the strychnia solution exactly in the same way, but omitting the current, and apparently no absorption took place. This method of introducing substances may be useful for therapeutic purposes. The author thinks that, with that view, the strength of current might be increased, and also the size of the electrodes, and that a careful investigation would show what parts of the body are most suitable for this method of administering medicines.

III, Sugar in Œdematous Fluids (*Bock*).—This paper by the deceased Dr Bock is published by his friend Hoffmann, from notes left. On account of the fragmentary nature of these papers, the communication is not quite complete in some points, although it contains many matters of interest. In testing for sugar in the fluids of the body, every trace of albumen should first be removed. The author found sugar in every variety of transudation fluid, and he gives notes of a number of cases. In one case of Bright's disease with great dropsy, the œdematous fluid contained $\cdot 04$ per cent. of sugar; and in another case of this kind, $\cdot 048$ per cent. In a case of heart disease with dropsy, it contained $\cdot 077$ per cent.; and in one of cancer of ovary with dropsy, $\cdot 045$ per cent. He also found sugar in pleuritic fluids, and in those of fly blisters. All these observations go to support the view that sugar is a normal constituent of the blood.

X. The Elastic Fibres of Reticulated Cartilage (*Deutschmann*).—In order to study the origin of the elastic fibres in reticulated cartilage, the author chose a cartilage, which, from hyaline, becomes, in course of life, reticulated. With this view, he examined the arytenoid cartilage of the calf and ox. He placed fine sections in a weak acid solution of carmine, as by this means the elastic fibres are coloured. He finds that the elastic network is developed from the cartilage cells, and he describes how the cells first become granular, then striate, the striation proceeding till the entire cell is fibrillated, the fibrillæ anastomosing with those of neighbouring cells. The granular condition extends to the hyaline cartilage around the cells, the granules here also arranging themselves in lines. These striæ and fibrillæ are the beginnings of the elastic fibres, which, therefore, have their origin from the cells. The author points out that these results correspond with those which Boll derived from the examination of connective tissue. That author states that he has often seen the elastic fibres proceed from the cell-plates, and pass into the connective tissue bundles. Hertwig also ascribes the origin of the elastic fibres to the protoplasm of the cells.

STRICKER'S MEDIZINISCHE JAHRBÜCHER.

PART II. 1874.

CONTENTS.—I. On cysts of the posterior wall of the bladder, by Dr J. Englisch, Vienna (2 Plates). II. Investigation of diseased bones, by Dr A. Ceccherelli, Florence. III. Investi-

tions on the microscopic constitution of the lochia, by Dr C. Rokitsky, Vienna. IV. Contributions to the theory of fever in embolic processes, by Dr G. Colasanti, Rome. V. The anatomy of a double monster, by Dr S. H. Scheiber, Bukarest (1 Plate). VI. On the formation of tubercle, by C. Heitzmann. VII. Histological studies on general croupous pneumonia, by Dr M. Heitter. VIII. On a peculiar marking in hyaline cartilage, by Dr L. Loewe.

I. Cysts of the Urinary Bladder (*Englisch*).—The author of this paper describes, in the first place, five cases of cysts of the urinary bladder, chiefly with a view to the probable origin of such growths. They originate for the most part in one of three ways. They may take origin from the remains of some embryonic structure, and in this case those in the middle line are related to the partially non-obiterated Müller's duct, and those placed laterally to the Wolffian bodies. They originate further from dilatation of the sinus prostaticus whose aperture has been closed; or, lastly, they may arise from the vesiculæ seminales, when obstructed by any process, especially inflammation. The author follows up his own cases by a brief statement of others, collected from various sources, and those specially interested will find here a summary of most recorded cases. The symptoms, diagnosis, and treatment are then brought under discussion. The symptoms differ somewhat, according to the exact situation of the cysts, and their size. If they originate near or in the prostate, their growth upwards is hindered by the firm connective tissue in that region, and so they soon produce disturbance by their pressure on the urethra in front, and the rectum behind. In these cases difficulty of micturition and defecation are, therefore, early symptoms. In the case of those originating further back, there may at first be very few symptoms at all, and it is only when they have grown large enough to fill the pelvis that any well-marked disturbance occurs. In this latter case, however, the cyst will press the bladder forward and downward, and the rectum backward. It will thus prevent the bladder filling properly, and there will be frequent micturition, and the pressure in the rectum will produce uneasiness and frequent defecation. As a rule, the case will be more or less serious according to the interference with the urethra. There may be pain in the testes and thighs due to the pressure of the growth. On examination with the catheter, some difficulty may be experienced in getting into the bladder, because the cyst situated between the bladder and rectum curves the urethra upward, and a sudden bend may appear like a

complete obstruction. After the catheter has been passed, the surgeon may make out the growth pushing forward the posterior wall, especially if the finger is simultaneously in the rectum. The differential diagnosis may be difficult. Perhaps diverticula of the bladder are most difficult to distinguish from cysts, but if within reach of the finger in the rectum, the latter may generally be distinguished by their greater mobility. The growth of these cysts is at first slow, and it is rare that it becomes rapid. Those obstructing the urethra may induce cystitis, and consequently pyelitis and nephritis, but these are not very frequent results. As to treatment, very little can be done. If the cyst is small, and producing no great inconvenience, it should be left alone. If it is large, and causing serious symptoms, the only efficient treatment is puncture, and in some cases it is necessary to open the bladder in order to do this effectually. It should in every case be borne in mind that the results of puncture are always uncertain, as inflammation of the bladder and peritoneum may occur in almost any case.

II. Cancer of Bone (*Ceccherelli*).—This is a small, but not altogether unimportant contribution to the discussion of the origin of cancer. The author examined a case of epithelioma of the upper jaw, in which the bone seemed to be implicated. He found, however, that although there was proliferation of the bone corpuscles, and rarification of the bone, yet there was no true cancer of bone, the bone corpuscles taking nothing to do with the formation of the nests of cancer-cells. The other case was described as a case of cancer of a long bone, and here certainly the proper bony tissue was replaced by cancerous. The author, however, could not make out whether the bone-corpuscles were concerned or not.

III. The Constituents of the Lochia (*Rokitansky*).—We have here in a tabular form the results of a large number of microscopic examinations of the lochia. The general conclusions come to seem to confirm the views of Cruveilhier and Simpson, that after birth the uterus is pretty much in the condition of a recently inflicted surgical wound. At first there is little but blood in the discharge, but soon pus appears, and it increases while the red blood corpuscles diminish up to a certain point. The diminution of the red corpuscles is not quite regular, being subject to certain variations, but with a general tendency to diminution. The pus increases regularly till the third day, after which it remains constant. Ciliated cells, whose nature is doubtful, occur in the lochia both of normal and unhealthy

cases, but they are also present in the vaginal discharge of non-parturient women. The author also enters into the question of the relation of bacteria and granules to puerperal fever and other complications of the puerperal state. His cases give no very certain results. He found these organisms both in unhealthy parturients, and in perfectly natural ones, although perhaps they may have been more abundant in puerperal fever. He also found bacteria in the vaginal secretion of non-parturient women, and he does not know whether they were of a different kind or not. He found the Zoogloea of Cohn both in normal and unhealthy cases.

VI. The Nature of Tubercle (*Heitzmann*).—It is impossible to follow this author through the whole of his paper; we must content ourselves with relating the general drift of it, and entering more into the conclusions he deduces. His conclusions are based on the *post mortem* examination of about 200 cases of tubercular disease, taking this expression in the older and more usual sense. These included cases of disease of the lungs, serous and mucous membranes, lymphatic glands, and kidneys. After a pretty accurate description of the naked-eye appearances in these cases, he proceeds to ask the question, What is the true criterion of tubercle? How is tuberculosis to be distinguished? He first negatives a number of views which have been supposed to supply the requisite distinguishing characters. It is not the arrangement in nodules, because, on the one hand, tubercle occurs both as an infiltration and in the nodular form, and on the other hand simple inflammation may produce the appearance of nodules. It is not the caseous metamorphosis (so-called crude or yellow tubercle), for this degeneration is not constant in tuberculosis, and occurs in other diseases. It is not that tubercle is heteroplastic; the view that the tubercle is lymphatic, and the more recent ideas of Schüppel are both mistaken. It is not that it is composed of small-celled elements, nor that the cells are deficient in vitality. The speciality of tubercle is that it is an inflammatory formation, but differing from other inflammatory products in that it has no blood-vessels. All ordinary inflammations are accompanied by the new formation of blood-vessels, but here are inflammations without them, and this is the only speciality. We confess to some doubt as to the gigantic importance of the result, which the author announces with something like a flourish of trumpets. He seems to us to take a great deal for granted throughout his paper, trusting much more to naked-eye appearances, than to histological characters, and not in any satisfactory way indicating his reasons for the fact,

that he tacitly assumes all to be tubercular which is popularly called tubercular. It is well known that most of our best observers now-a-days discriminate among the various forms of phthisis pulmonalis, for instance, some that are simply inflammatory, and others that are truly tubercular. But this author, without giving a single reason, simply treats all as tubercular. We are not inclined to accept, without reservation, his conclusions.

VII. Croupous Pneumonia (*Hütter*).—This author describes the histological conditions in acute pneumonia, which, as our readers are aware, commonly goes under the name of croupous pneumonia in Germany. The point of greatest interest in studying this disease, is whether the epithelium lining the lung-alveoli takes any active part in the process of inflammation, and especially whether it has to do with the production of the pus corpuscles, which become ultimately so abundant. The author finds in every stage evidences of the epithelium being actively concerned. In the earliest stage, that of engorgement, there are in the alveoli, along with abundant red blood corpuscles, large epithelial cells. In the further stages, he finds epithelial cells containing pigment, and others in which there are contained pus-corpuscles, which he considers to have been formed by endogenous production. The paper concludes with a very peculiar case of pneumonia. There were the usual symptoms during life of an acute pneumonia, and after death the lung presented the ordinary naked-eye appearances of grey hepatisation. But on microscopic examination, the lung-alveoli were filled, not with fibrine and pus-corpuscles, but with epithelial cells. The process in this case had consisted of desquamation and growth of the epithelial lining of the alveoli.

VIRCHOW'S ARCHIV.

VOLUME LXI., PART I.

CONTENTS.—I. A case of progressive bulbar paralysis of the (medulla oblongata) by Prof. R. Maier, Freiburg. II. Contribution to the condition of the circulation in the frog's lungs. From the Pathological Institute at Heidelberg, by Dr Küttner (Plate I.) III. On the normal and pathological growth of the long bones: a critical investigation on experimental and casuistical grounds, by Georg Wegner, Berlin (Plate II.-V.) IV. On the sweat-glands in man, by Hans Heynold, Leipzig (Plate VI.) V. The spider-web and pencil-celled glioma, by Dr T. Simon, Hamburg. VI. The physiology of the menopause, by Dr Cohnstein, Berlin. VII. Physical investigations on the

tympanitic and non-tympanitic percussion note, by Dr F. Klug, Budapest. VIII. Smaller communications: (1) On the occurrence of a considerable quantity of hamatoidin crystals in the sputum, by Dr F. Schultze, Heidelberg. (2) Some views, observations, and experiences on the method hitherto practised in vaccination, &c., by Grüll, Breslau. (3) The German association of sanitarians.

I. A Case of Progressive Bulbar Paralysis (*Maier*).

—The case recorded in this paper is one of great interest. The symptoms existing during life were those primarily of paralysis of the hypoglossal nerve, but afterwards extending gradually to a large proportion of the muscles of the body. This paper concerns itself chiefly with the anatomical alterations, and these may be summarised as follows:—1. The spinal cord presented a well-marked alteration of structure, the alteration being symmetrical and bilateral. The anterior cornua of the grey matter, and portions of the anterior and lateral columns, were the seat of the lesion. Of these columns it is chiefly the parts around the anterior median fissure and the internal parts of the lateral columns which were affected. The affection decreased in extent from the cervical region of the cord downwards. The anterior nerve-fibres were not infrequently thinned. The medulla oblongata was even more affected than the cord. It also was symmetrically altered, and chiefly in the floor of the fourth ventricle. On each side of the median groove the nucleus of the hypoglossal seemed to be specially altered, but the change also extended to the nucleus of the accessorio-vagus, and anteriorly into the medullary masses of the pyramids and olivary bodies. The intermedullary fibres of the accessorio-vagus and hypoglossal and the roots of these nerves were similarly altered. The disease extended upwards from the medulla oblongata to the pons and crura cerebri. 2. In all these situations the affection was similar, and consisted of a sclerotic inflammation, characterised by the formation of a homogeneous firm connective tissue and atrophy of the proper nervous structures, both cells and fibres, often with a yellow pigmentation of the cells. 3. It is interesting to note that this affection is not in patches, but occurs in continuous lines, and these lines are expressive of regions of corresponding physiological function. There is a degenerative process occurring in the anterior cornua of grey matter, and the surrounding medullary substance, extending from the lumbar region of the cord upwards, and affecting in the medulla oblongata and crura situations continuous with these regions of the cord. In the medulla oblongata the external parts, containing the

nucleus of the auditory nerves, and the sensory nucleus of the fifth, were unaltered, just as in the spinal cord the posterior cornua and the posterior columns and anterior parts of the lateral columns were normal. 4. The muscles were also altered, but the distribution of the alteration corresponded with the alteration of the nervous centres. Thus those supplied by the hypoglossal were everywhere altered; those by the facial only partially. The nature of this alteration was somewhat varied. In the superficial muscles of the neck (platysma, sterno-mastoid, laryngo-sternal), there was only atrophic diminution in size. In the muscles of the neck proper, there were further alterations—loss of the transverse striation, granular degeneration, splitting and fibrillation of the contents of the muscular bundles. In the muscles of the pharynx, tongue, and larynx, there were also considerable alterations, especially fatty infiltration and secondary atrophy of the muscular bundles. The muscles of the trunk, especially those of the back, and those of the head and foot, showed generally colloid and waxy degeneration. The author is of opinion that the affection here is originally one of the nervous system, a sclerotic myelitis of the medulla oblongata and cord, producing symptoms of progressive bulbar and spinal paralysis.

III. The Mode of Growth of Bones (*Wegner*).—This is a critical and experimental paper, in which the author supports by argument and actual observation the old view, that the growth of bones, going along with alterations in their shape, is due to a combination of the processes of apposition and absorption. This was the view of John Hunter, of Duhamel and Flourens, who asserted that the growth of bone is not by interstitial expansion. Of late there have been some who assert that there is an interstitial growth. Authors have occasionally pointed to the case of the lower jaw, where there is, during the growth of the bone, such a very marked alteration of shape that it seemed difficult to account for it by the processes of apposition and absorption. But even in this extreme case there are evidences, both microscopic and macroscopic, of the existence of both these processes. Lieberkühn's experiments by feeding animals with madder seemed to show that there is at the anterior border of the coronoid process a continuous external absorption. But the experiments of Humphrey are still more conclusive. A metal ring fixed round the ascending ramus of a growing lower-jaw becomes loose anteriorly and buried in the bone posteriorly, showing that the tissue is being absorbed in front, and new-formed behind. Then the discoveries of Kölliker and the author, of the part taken by the osteoclasts (giant cells), in the absorption

of bone, prove that there are, at various points on the surface, as well as internal parts of bones, centres of absorption, and these centres are discoverable in the lower jaw, just at the points required to modify the shape, &c. Perhaps the most recent attack on the views held by the author is that of Wolff (a pretty full abstract of which was given in this *Journal* December, 1870, p. 127). He endeavours to show that the architecture of the bones being a carefully-adjusted arrangement, and the architecture of bones at different stages of growth being similar, it is impossible to suppose an absorption and apposition as concerned in growth, because this would imply a dislocation of the lamellæ sufficient to disturb the whole architectural arrangement of the bone. He asserts, therefore, that the bone can only grow by interstitial enlargement, the full grown bone being simply an enlarged copy of the smaller one. But the present author points out that apposition and absorption are not merely coarse processes occurring on the surface of and inside bone, but fine alterations going on, it may be, in every lamella, and at various parts of the same lamella. It is also shown that spongy and dense bone are mutually convertible, and that by these fine processes any required architectural arrangement can be effected as readily as by interstitial growth. The interstitial growth of bone is further controverted on experimental grounds. It is an old observation, that when two pegs are introduced into the diaphysis of a growing bone, they do not, as the bone grows, get wider apart. The author confirms these experiments by fresh ones, and criticizes Wolff's, in which the increase of distance between the pegs is so little as to be within the possibility of error. A number of experiments are also given to prove that the growth in length of long bones is from the intermediate cartilage, and the growth in thickness from the periosteum. The results of his experiments with phosphorus are peculiarly interesting. This author has shown that when a growing animal is treated with phosphorus, the bone formed during this treatment is dense bone, although it may occupy the place where there is normally spongy bone. Now, the author treated growing animals at intervals with phosphorus, and found that zones of dense bone were in this way produced, and that these zones occupied the ends of the diaphyses. If the phosphorus treatment had been stopped for a time, the dense zone had passed towards the medullary cavity, and was covered by a layer of normal spongy bone. If the phosphorus had been given at intervals, then there were strata of dense bone alternating with spongy. These results are illustrated in Plate V. The author concludes that there is no evidence of an interstitial growth of bone.

VI. The Physiology of the Menopause (*Cohnstein*).—The period of cessation of the menses is very variable. According to the statistics of the author, the age varies from 25 to 59. It occurs mostly between 43 and 49, the average being 46.36. The usual duration is 28 to 34 years, or, on the average, 31 years. It stops suddenly in 24 per cent., gradually in 76%. Early or late occurrence of menstruation does not seem to alter the age at which it ceases, so that those who begin to menstruate early have a longer, or those who begin late a shorter duration. Certain other conditions seem to affect the duration of the menstrual period. Those who have menstruated early, who have married, who have borne more than three children, who have suckled their children, and who have borne a child at the age of from 38 to 42, seem to have the longest duration of the menstrual period.

VII. Tympanitic and Non-Tympanitic Percussion Note (*Klug*).—The author distinguishes the tympanitic from the non-tympanitic note in respect that the former is musical, and the latter not. But the musical note may be of various kinds. It may be a simple tone; or it may be a musical tone, with the harmonics in their due order; or it may be a tone with the harmonics in irregular order. In this last class the note consists like the pure musical tone of a ground-tone and harmonics, but the latter do not stand in regular relation to the ground tone. The non-tympanitic note is non-musical—is simply a noise, in which the vibrations are of no regular length, and a ground-tone or harmonics are indistinguishable.

PART II.

CONTENTS.—IX. Contributions to the histology and pathological anatomy of the sympathetic nervous system, by Dr A. Lubimoff, Moscow (Plates VII., VIII.) X. On the accessory glands of the generative organs, by Dr P. Langerhans, Freiburg (Plate IX.) XI. Contribution to the architecture of cancellated bone, by the same (Plate X.) XII. On the development of cicatrizing mammary cancer, by Dr S. Wolffberg, Erlangen (Plate XI.) XIII. Experimental investigations on the "waxy degeneration" of striated muscle, by Dr W. Wehl, Thal-Itter (Plate XII.) XIV. On the connection between constriction of the aorta and disease of the kidney (from the Pathological Institute at Berlin), by Dr J. Zelenko, St. Petersburg. XV. Smaller communications. (1) Glands of the substantia perforata, by Dr Neumann, Gernsbach (Plate XIII.) (2) Therapeutics of diarrhoea, by F. A. Hartzen.

IX. The Pathological Histology of the Sympathetic (*Lubimoff*).—As this paper is entirely descriptive, and attempts to go over the whole ground included in the title, it is impossible to give an abstract of it with any satisfaction. Those specially concerned in this kind of study will find an exact description of the method of investigation employed by the author. The various forms of lesion found, and the details of certain special cases are also given, and evidently great pains have been taken and great research devoted to the subject.

X. This is also a paper which has only special interest. The histology of the prostate, of the *vas deferens* and vesiculæ seminales, and of Cowper's glands, and their variations at different periods of life, are discussed.

XI. Architecture of Cancellated Bone (*Langerhans*).—This author describes the architectural arrangement of the lamellæ of the cancellated bony tissue in the vertebrae and the extremities. He illustrates his observations by drawings of sections of these bones, and confirms the view that lamellæ bear special relations to the lines of pressure.

XII. Development of Scirrhus of the Mamma (*Wolffberg*).—The observations of which the results are given in this paper were made under Rindfleisch at Bonn. The question to be solved is whether the cells of mammary scirrhus are derived from the glandular epithelium or not. He answers this question in the affirmative. The cellular processes and collections met with in scirrhus are traced directly to the glandular acini. The connective tissue of the gland is variably affected. It forms the stroma, and has essentially to do with the cicatrization and contraction so characteristic of scirrhus.

XIII. Waxy or Colloid Degeneration of Voluntary Muscle (*Wohl*).—This alteration of muscle, so frequently met with in typhus or typhoid fever, and other diseases, has been the subject of considerable discussion. Some have supposed it to be merely a *post-mortem* change; others have looked on it as inflammatory in its origin, while some consider it to be the result of a degenerative process, hence its most usual name. The author finds that it is possible to produce it artificially in the living animal. He experimented on the tongue of the frog, the transparency of that organ enabling one to conduct the investigation with facility. Injuries of the most varied kinds to the muscles of the tongue of the living frog, produce changes having the greatest resemblance to, and

probably identical with, this "waxy degeneration" of authors. The alteration may be produced, therefore, voluntarily, and it follows instantaneously, or nearly so, on the injury. This being the case, it can hardly be a degeneration, much less due to inflammation, and is more probably a coagulation of the contractile substance of the muscle. In this view of it the name waxy or colloid degeneration is a misnomer, and the author considers that the expression suggested by Neumann, "*schollige Zerklüftung*" (which may, perhaps, be translated *flaky disintegration*), is much more appropriate. The paper is accompanied by some drawings of the muscular fibres of the frog's tongue, from some of his cases, and the identity of the process with that met with in typhus fever in man, can hardly be doubted by any one familiar with the appearances in these cases.

XV. (2.) **Therapeutics of Diarrhœa** (*Hartsen*).—This is a rather dogmatic paper, but contains some sound sense too. Diarrhœa of all sorts goes along with an irritable state of the intestinal canal, and any increase of this irritability is to be carefully avoided. The author considers that the more usual astringents are, in addition, irritants, and he instances among these the salts of lead, zinc, and bismuth. In all cases soothing means should first be adopted, and of these, warm applications to the abdomen, in the form of broad poultices, or fomentations are perhaps the best. The chief medicine recommended is opium, which, of course, soothes, but it should be remembered that in large doses it interferes with digestion. If the diarrhœa is so violent as to hinder the absorption of opium introduced into the stomach, then morphia should be injected subcutaneously. Of equal importance is the diet. If the person is strong, everything, both solid and fluid, should be withheld, but where this cannot be done, the food should be of the lightest and simplest. The author specially refers to rice and arrowroot as simple vegetable diets, while any animal food given should be free from fat. Milk should not be too much used, and in any case should be boiled.

Clinical Record.



I.—CASE OF ABSCESS OF THE BRAIN.

Under the care of Dr J. D. MACLAREN.

Fatal case of Abscess of the Brain, 4½ months' duration, left hemiplegia, tonic spasm of fingers, vomiting, convulsions, squinting, dilated pupils—the result of a blow on the head.

MARGARET L—, æt. 23, sewing girl, unmarried, was admitted to the Royal Infirmary, under my care, on the 17th September, 1874, suffering from hemiplegia of the left side. On the 18th of last July she met with an accident. A smoothing iron accidentally fell from a height of three feet and struck her on the vertex. She was much stunned by the blow, but was not rendered insensible. The scalp was cut to the extent of an inch and a half, the wound extending from before backwards, a little to the right of the middle line. The anterior extremity of the wound was within half-an-inch of the forehead. It bled freely, but healed up at the end of three weeks, with no other treatment than keeping it clean. Ten days after the accident she began to lose power of the left arm; a week later the left leg became affected; and by the end of another week hemiplegia was complete on the left side.

On admission, her left arm and leg were paralysed, and her mouth was slightly twisted to the left side. There was some diminution of sensation over the feet. Her tongue was not affected by the paralysis. Her intellect was unaffected. She often had headache. Pupils normal; lungs and heart normal. Tongue rather dry, and furred. Appetite much impaired. Had much thirst; vomited frequently, not only after meals, but suddenly and unexpectedly at other times. Bowels regular. Temperature normal. A firm, healthy-looking cicatrix, an inch in length, was observed at the anterior part of the scalp where she had sustained the injury in July. Genito-urinary system normal. After her admission, some improvement was observed by the end of a fortnight, so that on the 6th October it was noted that she could flex her leg on her abdomen, and lift her hand nearly to her shoulder. On the 17th October she could stand, and bear her weight partially on the left leg, but could not walk without assistance. Her headache was often troublesome, however. It came on in agonizing paroxysms, and was chiefly confined to the forehead. She often vomited also, and remedies had little control over it. Towards the end of November, it was noted that she had suffered less from headache and vomiting, but that the palsy was more pronounced. Her left thumb about this time became firmly flexed across the palm of the hand, and the other fingers

were closed over it, and they could be opened out with difficulty. On December 5th, at 9 A.M., she had an epileptiform convulsion, with frothing at the mouth, lasting for ten minutes. She remained in a kind of stupor during the whole day after it, and her pupils became dilated, and continued so afterwards till death. On December 6th, she had another convulsion of the same kind, followed by stupor for some hours, and occasional squinting. She had no return of the fits till 11th December, but during that period she was often incoherent in her conversation, and slightly delirious, muttering to herself. On the 11th she had two fits at an interval of some hours. On the evening of the 12th December she died, after having had three convulsive fits during the day.

The treatment throughout her illness consisted in dealing with symptoms as they arose. She had a variety of applications with the view of relieving the headache, and when the vomiting was troublesome the usual measures were resorted to for the purpose of alleviating that symptom. When the convulsive fits made their appearance Bromide of Potassium was administered, and every effort was made to sustain her strength by tonics and suitable nourishment.

A *post-mortem* examination was made on the 14th December—the head only being examined. On removing the scalp, a depression was observed in the skull corresponding with the situation of the cicatrix observed during life. A portion of the external table of the skull was driven into the diploë, and lay there as a sequestrum. The internal table was thinner than normal, and at one point there was a small opening sufficient to allow a probe to pass. No pus could be observed in the neighbourhood of the injury. It was the frontal bone which had received the blow, at a point midway between the supraorbital ridge, and the coronal suture, and a little to the right of the middle line. The depression was about an inch and a-half in length, and three-eighths of an inch in breadth. The dura-mater was generally somewhat hyperæmic, and adhered slightly to the arachnoid. The surface of the brain was dry and sticky, and the borders of the sulci were glued together slightly. The surface of the right hemisphere was more prominent than the left, and on separating the edges of the longitudinal fissure, it was seen to bulge beyond the middle line. The convolutions on the middle lobe were paler than natural, and slight fluctuation could be detected. On slicing across the right hemisphere, above the level of the corpus callosum, an abscess was revealed, occupying the white matter of the brain, with a well-marked pyogenic membrane enclosing it. The pus was of a green colour, and creamy consistence, and had no bad odour. There would be about three or four ounces altogether. The brain substance around the abscess has slightly altered in appearance, and the surface of the right ventricle was hyperæmic. The surface of the fornix was adherent to the optic thalamus, and the corpus striatum of the right side was slightly softened. The other parts of the brain were normal.

Commentary.—The diagnosis in this case rested mainly on the history. On learning that she had received a severe blow on the head on the 18th July, and that within ten days of the occurrence, and while the wound was still open, symptoms of hemiplegia supervened, we naturally associated the two as cause and effect. We drew the inference also that a most natural result of the blow would be the development of inflammatory mischief in the brain. No doubt hæmorrhage might have taken place, but if that had been the cause of the paralysis it would have taken place within a few hours of the accident, instead of ten days after it; and it was to be expected that within four months, absorption of the clot would have taken place to some extent, and diminution of the paralysis become more apparent. The theory of chronic inflammatory mischief in the right hemisphere of the brain was also supported by her symptoms. She had occasionally severe headache, repeated fits of vomiting, tonic spasm of the fingers of the left hand, and, latterly, convulsions and squinting. These are just the symptoms which usually appear in abscess of the brain. The prolonged duration of the disease was no doubt owing to the formation of a pyogenic membrane, which confined the pus within a circumscribed space. The situation of the abscess makes it plain that inflammation was lit up at the seat of *contre-coup*. There was singularly little irritation, and no pus in the immediate neighbourhood of the seat of injury. Judging from the cicatrix, we came to the conclusion that if the skull had been injured it must have recovered from it. No depression was observable, and there was no tenderness over the scar. After death, the sequestrum formed by the external table of the skull was found lying harmless in the diploe. This leads to the reflection that possibly many cases of so-called idiopathic abscess of the brain may be really due to blows received on the head, which, having produced no scalp wound and no fracture of the skull, were overlooked on enquiring into the history of the illness, but which, nevertheless, may have been sufficient to produce inflammatory mischief, and abscess of the brain at the seat of *contre-coup*. It is manifest that in a case of this kind no surgical interference could have been of any avail, and the medical treatment was reduced to alleviating suffering.

TRANSACTIONS OF The Medico-Chirurgical Society.

SESSION 1874-75.

SECOND MEETING, 16th October, 1874—Dr Merton, President, in the Chair.

Dr A. M. Buchanan and Mr William Fleming, M.B., were elected members.

Dr William Macewen read a paper on

“PENETRATING WOUNDS OF THE THORAX AND ABDOMEN,”

which will be found at page 1 of the present number of this *Journal*.

Dr Watson said that the paper was one of great interest to surgeons. One thing occurred to him in regard to the closing of wounds of the thorax. Dr Macewen had mentioned that in his first case he studied the wound after the hæmorrhage ceased, but he did not mention what period in relation to the respiration he selected for the purpose. If he might intrude a physiological notion into such a practical subject, he would say that the proper time to do so was at the end of a prolonged expiration, when the parietes were nearest the surface of the lung, and the chance of air being included was the smallest. With regard to wounds of the abdomen, he had to congratulate Dr Macewen on his success in his cases. His plan of procedure was exceedingly judicious. He himself had, not long ago, published a case of a wound in the abdomen, in which the bowel was protruded and wounded. This case recovered. With regard to such accidents, he thought it of great importance to impress upon practitioners and police surgeons the danger of attempting reduction of the bowel, when the surrounding circumstances were unfavourable—for instance, in a dirty cellar. In such cases no attempt should be made at reduction with such surroundings. His success in the case to which he referred was in a great measure to be attributed to the fact that the reduction was effected, not by the practitioner who saw the case first, but in the hospital. Another point he had to notice, viz., the great success of catgut sutures in these cases. In his case they were introduced into the bowel itself, the wound healed, and the sutures were no more heard of. The bulk of penetrating wounds of the abdomen were fatal. One question he would put to the meeting. Supposing a part of the bowel was protruded, say six or eight inches, and so injured as not, in the opinion of the surgeon, to be viable, what should be done? Were they to treat the case like one of sloughed hernia, or would this not tend to increase the shock of the patient?

Dr Richmond, Paisley, mentioned two cases, both fatal, which he had seen. One was that of a little girl, who was accidentally punctured by a needle over the region of the heart. The wound was a mere speck, but he expressed an opinion that part of the needle had entered the heart. The other case was that of a lad gored by a cow. There was a large opening in the abdomen, but no bowel protruding. On *post mortem* examination, it was found that the horn of the cow had carried backwards a knuckle of the bowel. With regard to the query put by Dr Watson, he thought that amputating the protruding part, and applying sutures, would be the proper treatment.

Mr John Reid said that the first case was very interesting, indeed, and showed that lung tissue could be subjected with impunity to manipulation of various kinds like any other part. The second case was of less interest, as, in the absence of hæmoptysis, it was likely that the lung was not injured. In regard to the wounds of the abdomen, it did not appear that in either of them had the intestine been wounded.

Dr Macewen asked how, on this assumption, *Mr Reid* would account for the grumous discharge in the last case?

Mr Reid said that such a discharge was possible though the intestine was not wounded. The wound might give rise to such a discharge. One point of importance was the amount of credit to be given for the success of the treatment to the antiseptic system. He noticed that in all these cases there was considerable discharge. According to *Mr Lister*, there should, on his treatment, be no discharge, sanguineous, purulent, or grumous. Long before the antiseptic treatment was heard of, there were similar cases of recovery after such wounds. When in country practice, he had seen a case in which a young man had fallen on a broken bottle, which made an incision of three or four inches in the abdomen. Two handfuls of intestines protruded. These were returned at once, and fastened with quill sutures, and the case did well. Had such a case been treated antiseptically, the carbolic acid lotion would have been credited with the cure. Then again, catgut ligatures were no new thing. They had been used by *Pott* or *Abercromby* in tying the external iliac. In wounds, particularly those of the thorax and the abdomen, he held that the application of an irritating substance, such as carbolic acid, would rather do harm than good. In all these cases he would be inclined simply to return the bowel, and close the wound either with common thread sutures, the quilled or catgut suture.

Dr H. Cameron said, that in regard to the hæmorrhage in the wounds of the thorax, it was not always that the bleeding found exit externally. In one case which he had seen, in which a butcher boy threw a long butcher's knife at another boy, making a wound of the thorax a little below the apex-beat of the heart, the patient on admission was in a state of collapse. There was also that peculiar gasping at the upper part of the chest somewhat similar to that referred to in *Dr Macewen's* first case. There was also a considerable amount of hæmoptysis, and a piece of omentum protruded from the wound. He put in a pair of forceps with lint, dipped in carbolic acid and oil. But the point was this. There was no hæmorrhage externally, but a considerable amount of hæmo-pneumothorax, and what he would like to ask *Dr Macewen* was, whether he had satisfied himself, by observing the physical signs of the chest, whether there was in his case any hæmorrhage into the pleural cavity? With regard to *Dr Reid's* remarks on the antiseptic treatment, he would like to know where that gentleman had learned that *Mr Lister* taught that on injecting carbolic acid there would be no sanguineous discharge. No person surely could be so enthusiastic as to believe that in any treatment where there were divided vessels, there would be no bleeding. On the contrary, *Mr Lister* had always insisted on the necessity, of not boxing up the wound, so as to permit the fluid to escape. Catgut ligatures, *Mr Reid* was correct in saying, were an old invention. It was *Sir Philip Crampton*, of Dublin, he would find, and not *Abercromby*, who used such a ligature in tying the external iliac, but unfortunately he was not successful. Catgut ligature was one thing, and catgut ligature used under antiseptic conditions was quite another thing.

The *President* reminded the society that they had some years ago present

at a meeting of that society, an American practitioner who described the treatment of wounds of the thorax in the American war. They were treated by hermetically sealing them, or *rancing*, as it was called. That gentleman was asked how many of the cases got well, and replied, with the quaintness of his nation, "he guessed they all got well." If this were the case, they would have no chance in going to war with their American cousins. The first case of Dr Macewen was a very interesting one, and he was entitled to no little credit for the dexterous way in which he extracted the knife. In the other cases he did not think any viscus was wounded, and their recovery was less remarkable.

Dr Macewen, in reply, said that, as a casualty surgeon, he never saw cases at first in a cellar. The accidents generally occurred in the street, and the patients were brought to the Police Office, in which a room was set apart for them. In answer to Dr Cameron, he said there was no pneumothorax in his first case, and there was no dulness. He attributed this partly to the very tight bandage of sticking plaster. With regard to the hermetically sealing of wounds, he had tried collodion, but only after they had been injected with carbolic acid. A considerable number of the cases did well, while in others the collodion had to be removed to allow the escape of pus.

Dr Maclaren read a

"CASE OF ENTERITIS, WITH REMARKS,"

which will be found at page 17 of the present number.

Dr Perry said that he had seen the case and could corroborate what Dr Maclaren had said in regard to it. The most striking thing was the want of any systemic disturbance, and the tympanitis. He had seen several similar cases.

Dr Joseph Coats said that pathologically the case had no analogy whatever to enteric fever. He would, however, take exception to one point in Dr Maclaren's description of enteritis. He described it as an inflammatory affection of the *entire thickness* of the bowel. Now, he thought that this was inaccurate. It was primarily an affection of the mucous membrane of the bowel, and did not extend much farther. For a considerable period, at least, the lesion was confined to the mucous membrane, and it was as a secondary affection that it attacked the sub-mucous tissue. In the large intestine the mucous membrane was exposed to mechanical causes which would give rise to the lesion; while in the smaller intestine it was less exposed to these causes. It appeared to him certain that enteritis was primarily an affection of the mucous membrane.

Mr John Reid said that Dr Maclaren's case appeared to have been one of sub-acute, or chronic enteritis; and from the tympanitis he was induced to think that the inflammation originated in the serous covering of the intestine. They never found tympanitis in a pure inflammation of the mucous membrane. What astonished him was that the lesion did not lead to ileus. The portion of the ilium in which the perforation existed, being about five or six inches from the caecum, tended to corroborate this view. Dr Abercromby gave it as his opinion that in such cases generally the inflammation first effected the serous membrane. The fact of the perforation being so very small did not militate against that view. The tympanitis being so extreme was, to his mind, proof positive that it was a case of peritonitis of this covering of the bowel from the beginning. Any inflammation of the mucous membrane would have been evidenced by more decided symptoms.

Dr Hugh Thomson said that the peculiarity of the case was in its group

on to ulceration only gradually. He thought there was no reason to suppose that the inflammation began in the peritoneum. In such a case there would have been adhesion, and also clinically there would have been more decided symptoms. It was possible that perforation had taken place whilst patient was at stool. The moral of the case was the imperative necessity of insisting upon rest in such cases.

The President thought that the phenomena of the case could be explained best on the supposition that ulceration had begun prior to the patient's admission to hospital. There appeared from the symptoms, especially the tympanitis, to have been some degree of peritonitis on admission. In regard to treatment there was one point in which he differed from Dr Maclaren. He thought opium was strongly indicated in the case. It would have combated the symptoms, allayed pain, and even, by its paralysing action, have facilitated the action of the bowels. It was a case in which he would have been inclined to have tried, internally, carbolic acid or creasote.

Dr Maclaren said that there could have been very little peritonitis in the case from the few shreds of lymph that were found. With regard to the question where the inflammation commenced, he had no doubt that from a pathological point of view Dr Coats was correct; but speaking clinically, the symptoms were such as to make him conclude that the whole surface of bowel was implicated. The chief feature in the case was the diagnostic value of persistent tympanitis in enteritis.

THIRD MEETING, 6th November, 1874.—Dr Morton, President, in the chair.

Mr J. H. Lilly, L.R.C.P.E., Superintendent of Western Infirmary, was elected a member.

Dr Cassells exhibited, under the microscope, a specimen of *Aspergillus Nigricans*, and read a paper on

“PARASITIC DISEASES OF THE EAR,”

which will be found at page 34.

The President thought that it was more probable that this fungoid affection of the ear had formerly existed in this country without being detected, than that its distribution was limited by some geographical or climatic considerations to Germany. It must be remembered that in this country special attention had been directed to the minute structure and diseased conditions of this organ only in comparatively recent times by such men as Toynbee, Wilde, Harvey, and Yearsley, and their successors.

Dr Hugh Thomson said that in regard to the question of developing these fungi experimentally in a healthy ear, it must be remembered that a certain suitability of soil and other conditions was a necessity of their existence. For example, the parasite *Microsporon furfurans* that gave rise to the disease of the skin, *Pityriasis Versicolor*, must be covered from the air. The particular fungus under discussion seemed to require the shelter of the ear. It was also a well known fact that some individuals were more pre-disposed to parasitic diseases than others. Some fungi, indeed, did not appear to be capable of growing in some individuals. As regarded the skin, indeed it was a moot question whether their existence did not betoken a previously morbid condition of the skin, which afforded a nidus for their growth. Such a question would be difficult to decide, but the answer to it would not affect the treatment. In regard to treatment, the best parasiticide he had tried was the white precipitate, which had some qualities peculiarly fitting it for such an application. The best mode of applying it to the ear would

be by insufflation. It would be curious to know whether in two of the cases to which Dr Cassells had adverted, the parasite was got from Geranium leaves. A thorough investigation of this leaf would determine the question whether it served as a *habitat* for the fungus. It was more probable, he thought, that the spores of the fungus had been carried through the air, and had thus got access to the ear.

Dr Dougall said that having paid much attention to the special conditions under which fungi were developed, he could speak with some authority on the subject. In the first place, all fungi required an acid soil. He had proved this fact many times, but it was certain that no fungus would grow in an alkaline solution. Therefore, the proper antidote to a parasitic growth of this kind was to give it a dose of some alkali. Till that afternoon he was not aware whether the cerumen of the ear was alkaline, neutral, or acid in its reaction; but, prompted by curiosity, he had tested it, and found it distinctly acid. With regard to the fungus exhibited by Dr Cassells, he was strongly convinced that it was identical, or, at all events, nearly allied to that discovered by M. Pouchet. In his endeavours to establish his theory of spontaneous generation, that gentleman tried the following experiment, which he (*Dr Dougall*) had verified by repeating it. He took wheaten flour, boiled it into a paste, and, having spread it out on a surface, he wrote on the paste with a solution of nut-galls, previously prepared for the experiment; in a short time there was an exuberant crop of a fungus to which he gave the name of *aspergillus primigenius*. This experiment appeared to M. Pouchet as proving that the seeds of the fungus did not exist in the air, and, therefore, confirming his doctrine of spontaneous generation. With regard to fungi in general, his impression was that they were the result of a diseased condition, not the cause of it. Fungi could only grow on a prepared soil, and, as a rule, such a soil indicated a standard of vitality more or less removed from the normal. He was of opinion that this fungus would grow on the wax taken out of the ear.

Dr Cassells enquired why, on this assumption, the fungus was so unfrequently found in the ear?

Dr Dougall replied that the matter had been little investigated, and he believed that when more attention was given to the subject it would be found that there would be a great reduction in the number of varieties of these fungi. At present young and adult specimens of the same variety had different names assigned to them. He had seen the *aspergillus*, when allowed to lie for some time on paste, develop into a crop of *Penicillium*.

Dr Fergus said that, in regard to M. Pouchet's experiment, there appeared a more natural explanation of the phenomenon than that afforded by the theory of spontaneous generation. On the assumption that every fungus had its own peculiar nidus, without which it would not develop, they had only to assume that the paste itself did not constitute such a nidus, but that the paste, with this solution of nut-galls, gave rise to the physical conditions necessary for the growth of that particular organism.

Mr William J. Fleming said that, in regard to M. Pouchet's experiment, the result would be affected by the circumstance whether the infusion of nut-galls were *boiled* immediately before it was used. There was another point which was worth remarking on. He had heard the suggestion made—and it seemed to him a feasible one—that the cerumen of the ear was in itself possessed of antiseptic properties. In fractures of the base of the skull, in which there was a discharge of blood from the ear, there was seldom any putrefactive change. This was a remarkable fact, let the explanation be what it might.

Dr Joseph Coats remarked on the extraordinary terminology of the diseases which *Dr Cassells* had described. This special affection had been described under some three or four names, while the nomenclature of some of the other affections incidentally alluded to was perfectly in keeping. Surely it would be simple enough to describe an affection depending on this parasite by one adequate term. The question raised, whether the disease was produced by the parasite, or whether the fungus developed on account of the pre-existence of disease, was one of much interest, and opened up a tempting field of inquiry. The other question raised, whether the fungus was a true parasite or not, was of less importance, and was indeed to some extent a mere verbal question. An organism attached to a particular part, and there slowly bringing about a structural change, was surely a parasite. Nobody would deny, for example, that favus, though doubtless requiring as a pre-requisite of its development a certain condition of the scalp, yet after the spores and mycelium of the organism had penetrated the substance of the hairs and epidermis, was really a parasitic affection. In the same way it appeared to him idle to deny the parasitic nature of the fungus under discussion, after its mycelium had penetrated the layers of the membrana tympani, and had done the damage there.

Dr Dougall said, in reference to several remarks directed to what he had said, that it had not been his intention to vindicate the theory of *M. Pouchet*, to which he had alluded only incidentally. There was always a predisposing cause for the development of fungi. A curious example of this was mentioned by *Mr Huxley* in his address at the opening of the British Association in Liverpool. The fly, as *Mr Huxley* pointed out, frequently perished from a fungus—the *Empusa Muscæ*—which ate away the creature's viscera. The disease was originated by a spore falling on the fly and germinating, but it only so germinated in autumn, when it might be presumed the body of the fly was ready for it.

Mr John Reid complimented *Dr Cassells* on the excellence of his paper. In regard to the question of the extreme rarity of the affection, he was inclined to think that the cases had simply not been discovered, although the disease existed.

Dr Cassells, in reply, said in regard to the question of priority of discovery, he might state that immediately after the publication of his paper a letter appeared from another gentleman, who stated that in examining some debris an *aspergillus nigricans* had been found. This announcement was, however, subsequent to the publication of his case, and the merit of priority had been awarded to him. In the literature of aural surgery, which he had examined, almost nothing was said on the subject. In his "Questions of Aural Surgery," lately published, *Mr Hinton*, who of course did not profess to have seen a case, dismissed the subject with a reference to the utility in such cases of bichloride of mercury. He (*Dr Cassells*) was satisfied, however, that the affection was not one of such extreme rarity as the paucity of published cases would lead them to infer. As he had already stated, in one week he had seen three cases, and he thought, from the great success of the alcohol treatment in from some ten or twenty other cases of a doubtful character, that in these there was some presumptive evidence of the existence of this parasitic disease. When he spoke of the treatment by alcohol he meant pure alcohol, and not strong whisky, which had been quite inoperative in a case in which it had been tried through inadvertence. With respect to *Dr Dougall's* statement of the acidity of the cerumen, he took leave to doubt the fact, as there was in its composition a considerable amount of soda, as *Rooga* had shown.

Dr Dougall said that this was 'not incompatible with it having an acid reaction—a fact which he offered to demonstrate on the spot.

Dr Cassells said that, besides, the cerumen of the ear was not the soil on which the fungus grew. It was adherent to the membrane, from which the cerumen was distant an inch and a half in ordinary cases. Of course he admitted the possibility of its being washed in occasionally to the membrane. *Dr Dougall's* alkaline treatment had yielded no result in the hands of *Kuhenmeister*, and this was not favourable to *Dr Dougall's* theory. He was also somewhat sceptical of the possibility of an *aspergillus* developing into a *penicillium*. At all events such a metamorphosis had been denied by the best authorities. With regard to the nomenclature of the affection which had been half seriously objected to by *Dr Joseph Coats*, he feared there was no help for it. *Otitis parasitica* expressed one view of this disease, and *myringomycosis* another. He demurred, however, to *Dr Coats's* statement that the question of the parasitic nature of the affection was of little or no importance. It was important, in so far as it seriously affected the view they took in respect to its treatment. If the organism were merely a sarcophyte, all that they had to do was to remove the dead tissue; but in the case of a parasitic affection, they had not only to remove the parasite, but to bring the parts into such a state as to make its subsequent growth impossible.

Glasgow Pathological and Clinical Society.

SECOND SESSION, 1874-75.

FIRST MEETING.—The President, *Dr W. T. Gairdner*, delivered an introductory address on the "Progress of Pathology." This was published *in extenso* in the *British Medical Journal*, for October 24th, 1874.

SECOND MEETING, November 10th, 1874.

Dr Hector C. Cameron, presented the Report of the Committee appointed to consider the clinical history and nature of a RECURRENT FIBROID TUMOUR shown by him at the last meeting of the previous session. The patient, now fifty-five years of age, first noticed a tumour on her abdomen soon after her marriage in 1850. It was situated about two inches above the middle of Poupart's ligament, and grew rapidly. It was removed by the late *Dr Lyon* in November, 1851, three months after the birth of her first child, being then about the size of a lemon. After the birth of her third child the tumour recurred, near to the old cicatrix, and was removed; but again recurred, and was removed the third time by *Dr Lyon* after an interval of eighteen months. Seven years now elapsed before it again required operation. This time it grew rapidly, and to a greater size than it had ever done before. *Dr Lyon* once more removed it, and, as on this occasion, he entirely cut away the umbilicus, it is evident that this tumour was situated higher up and nearer the middle line than any of its predecessors. After

an unknown interval (during which several button-like projections were removed by the knife) the tumour returned, and another surgeon tried to destroy it with caustic, but with incomplete success; the tumour again grew slowly, but did not trouble her much. In April 1874, Dr Cameron removed the tumour exhibited; it was situated about three inches above the middle of the Poupart's ligament, and, being pressed on by the clothes, became painful. Another tumour existed also a little below and to the outer side of the anterior superior spine of the ilium, but being painless, slow in growth, and causing no inconvenience, it was left alone. The whole region from the former site of the umbilicus to the tumour still remaining (measuring seven inches transversely by three vertically) was a mass of cicatrix, and was studded here and there with small fibrous out-growths, varying from the size of a barley-corn to that of a horse-bean. These bled if struck or much irritated by patient's clothes, and frequently broke off spontaneously, free bleeding then taking place. A large one of the size of a cherry caused bleeding to the extent of producing syncope. The patient was in perfectly good health, with the exception of this local condition of the abdomen. The tumour shown was subcutaneous, adherent to the skin but freely movable upon the abdominal walls.

Dr Joseph Coats reported the tumour to have all the microscopic characters of the group described under the names of recurrent fibroid, fibro-plastic, and fibro-sarcoma. The spindle shaped cells of which it was composed lay parallel to each other in pretty large bundles, so as to give the appearance of fibres under a low power, but a higher power brought out the cellular character, and showed that the cells contained oval or oblong nuclei. The tumour was thus a sarcoma, or, if a more specific name be required, a fasciculated sarcoma, or fibro-sarcoma. Dr Coats remarked that the name fibro-plastic was objectionable on two grounds,—firstly, because it involved the theory that these cells were *fibro-plastic*, that is, concerned in the formation of fibres; and secondly, because the tumour so named was liable to be confused with the fibro-cellular, which was of a totally different structure and nature.

Dr H. C. Cameron showed a MAMMARY TUMOUR which he had removed, and also two others, smaller and much softer, which had recurred the one after the other within a few weeks of the operation, at the site of the wound. He also showed a large tumour removed from the axilla of a girl; although this had not yet recurred (the operation being but recently performed), it seemed to belong to the same class.

Dr Joseph Coats referred to the sections of the tumours shown, which, at Dr Cameron's request, he had placed under the microscopes. It appeared to him that the structure of these tumours alone was a strong argument in favour of the name sarcoma. In all of them the cells were very abundant, but their characters differed. The tumour removed from the axilla was composed chiefly of round cells, and such a growth could not of course be included under Paget's group of recurrent fibroids, nor Lebert's fibro-plastic tumours; yet its analogies with the others were such as to induce one to class it with them as a sarcoma. The large tumour from the mamma presented differences in structure at different parts. In some parts it was composed of dense connective tissue, and in others the tissue had

all the appearances of the fibro-sarcoma, abundant spindle-shaped cells being the essential elements. The recurring tumours in this case were homogeneous in structure, and exceedingly cellular throughout. The cells were mostly spindle-shaped, but in some parts round.

Mr Henry E. Clark showed a preparation of an aorta in which were two ANEURISMS. The upper of these, situated in the ascending part of the arch, was very large, and was in process of spontaneous cure, the fibrinous layers being of very firm consistence, and fully two inches thick. This aneurism had pushed aside the neighbouring parts, but without producing any great degree of pressure upon them; the pneumogastric and inferior laryngeal nerves, although in contact with the aneurism, were not embedded in its wall, nor had they in any degree suffered. The second aneurism, of much smaller size, involved only the posterior part and right side of the descending aorta, opposite to the fourth dorsal vertebra; it was so firmly adherent to the vertebrae that the sac was torn in its removal. Evidences of repair, so manifest in the larger aneurism, were entirely wanting in this. An opening about an eighth of an inch in diameter was found to communicate between the sac and the oesophagus, and there could be no doubt that this had been the cause of death.

Dr Renfrew, who saw the patient (a man) shortly before death, said that the *post mortem* appearances entirely agreed with the symptoms which he had noted during life. He had then diagnosed the case to be one of aneurism bursting into the oesophagus.

Dr Maclaren, under whose care the patient had been for some time in the Royal Infirmary, said that the signs of the upper of the two aneurisms were well marked when the patient was in the Infirmary, but no suspicion had been entertained as to the existence of a smaller one lower down. The patient had complained of dysphagia, and the pain was referred to a spot opposite the middle of the sternum.

Dr Finlayson contrasted this case with one recorded by *Dr Bennett*, in which the fatal growth of the higher aneurism had led to the cure of the lower one. In this case the great mass of fibrine in the upper one had apparently had no beneficial action on the small one, whose walls were free from clot, and the perforation of which had caused death.

Dr Gairdner had seen the case during life, but had no accurate recollection of it. The diagnosis of double aneurism had sometimes been possible to him, not so much from physical signs as from the physiological effects demanding a double cause.

Dr Poulis showed a specimen of an ANEURISM OPENING INTO THE SPINAL CANAL, removed from a patient (aged 37) of *Dr Gairdner*'s. The origin of the disease seemed to be traceable back for two years, but the nervous symptoms were only of about two months' duration. Shooting pains in the legs, followed by weakness, and ultimately complete paralysis and anaesthesia of the lower limbs, together with retention of urine, and obstinate constipation, constituted the main symptoms. There was intense pain over the fifth and sixth dorsal spines, extending round to the cardiac region; a systolic *bruit* was audible at the apex of the heart; there was only a sub-febrile elevation of temperature. Ultimately serious vesical

complications and bed-sores supervened. During his stay in hospital—three or four weeks—the bowels only acted once, under strong galvanic stimulation, various medicines having been tried without avail; vomiting and retching were troublesome. At the *post mortem* inspection the bowels were found full of clayey fæces, the walls of the bladder in a state of slough, and the ureters and pelves of kidneys were congested and coated with mucopurulent matter. A small tumour was found lying at the right side of the thoracic aorta, but springing from its posterior part opposite the fifth dorsal vertebra; it was partly occupied by coagula, laminated clot, and a few loose spicula of bone. The aneurism had destroyed the body of the fifth, and part of the fourth and sixth dorsal vertebrae, and extended into the spinal canal by a ragged opening at the head of the fifth rib, which was quite loose. The spinal cord was pressed aside, but its sheath was not opened into by the aneurism, which had begun to point in the left spinal groove. With the exception of the slight bulging referred to, the aneurism was entirely confined to the bodies of the vertebrae, and altogether presented a very circumscribed area. The spinal cord was rather soft below the aneurism, but above it the nervous tissue was normal. The heart was normal; the aorta slightly atheromatous.

Dr Gairdner said that such terminations in aneurism were well enough known, but in the present case aneurism was not made out, and from the small size and depth of the tumour, the diagnosis was probably impossible.

Dr Thomas Reid showed a man, aged 36, admitted to the Eye Infirmary with defective vision on the left side, and having been affected, as alleged, with LEAD POISONING. There was a blue line on the gums. He had been in the Royal Infirmary for two months with a degree of hemiplegia affecting the left side; this came on about a year ago in connection with a fit of partial insensibility, but of this no good account could be obtained. On admission the vision was defective in the left eye, and he had a difficulty in seeing in the downward direction. The ophthalmoscope showed the left disc to be oval, with the long axis vertical, of a pearly white appearance, and with a whitish exudation at the inner margin of the disc, but not extending beyond it. The retinal vessels were diminished in calibre. The right disc was also oval-shaped, but there was no exudation. Under treatment with Iodide of Potassium the sight had improved, so that he could now read No. 1; the field of vision, however, although improved, was still contracted (equal in all directions and in both eyes), so as to extend only to thirty degrees in diameter as measured by the perimeter. *Dr Reid* thought the appearances and the course of the case pointed to some constitutional affection; and without committing himself to the hypothesis of lead poisoning, he thought the exudation resembled that described by the late *Dr George Rainy* in *Dr Scott Orr's* case of Lead Amaurosis (*Glasgow Medical Journal*, October 1866), *Dr Reid* having frequently examined the eyes of that patient.

Dr Finlayson had, at *Dr Reid's* request, examined this patient as to his

history and present condition, but had failed to find any satisfactory evidence of lead-poisoning. In particular, there had been no colic or lead paralysis properly so called. The paralytic symptoms remaining were purely those of cerebral hemiplegia; the muscles responded perfectly to the induced current. The blue line seemed to him to have its diagnostic value much lessened from the extremely bad state of the teeth and gums. The cerebral lesion *might* be due to lead-poisoning, as some cases of lead affection seem to have occurred without colic or other signs of this poison.

Dr Scott Orr, under whose care the patient had been while in the Royal Infirmary, had not satisfied himself that the case was one of lead-poisoning. The case of lead-amaurosis which he had reported in the *Glasgow Medical Journal* for 1860, was an undoubted case, and was vouched for by the late *Dr Mackenzie*.

THIRD MEETING, November 17th, 1874.

Dr Wm. Macewen showed a specimen of fluid removed from the bursa over the great trochanter, containing RICE-LIKE BODIES similar to those found in bursal swellings at the wrist.

Dr A. Wood Smith showed the thoracic viscera just removed from a case of EMPHYZEMA.

Dr Hugh Thomson showed an EPITHELIOMA which had been removed from the lower lip of a man, aged 35. It had existed for three years, and, beginning as a wart, had involved three-fourths of the lip.

Dr Thomas Reid showed microscopic specimens of this tumour and drawings of the appearances. This case belonged to the papillary variety of epithelioma, and formed a contrast and a supplement to the varieties brought before the society last session, which were principally of glandular origin. The present epithelioma involved the papillæ, and was situated, as usual, at the junction of the mucous membrane and the skin, involving about half-an-inch of each. The tegumentary portion presented the usual characteristic warty appearances, and was covered by a brownish crust about the size of a sixpence; beyond this, there were small indurations. The surface of the mucous membrane was still intact, but presented numerous flattened nodules, with depressions between, as far as the labial glands. On making a section vertical to the edge of the lip, the part beneath the crust was seen to consist exclusively of enlarged truncated papillæ, with epithelioma extending deeply into the intervening hollows, and in some cases containing rudimentary "pearly knots." In the mucous surface, the depressions between the papillæ were partially filled with desquamated epithelial scales; the epithelium extending a considerable distance into the tissue, and presented in this way the appearance of very vascular hypertrophied papillæ, in which were traces of rudimentary pearly knots. *Dr Reid* said this form of epithelioma appeared to consist essentially, in the first instance, of hypertrophy of the papillæ, with thickening of the epidermic and mucous layers by increased cell formation. The sebaceous and sudoriparous glands seemed little or not at all affected, or, at least, not more than might be expected from the irritation caused by the morbid development of the other structures.

Dr George Buchanan showed a young lad whose leg had been amputated by CAIRDEN'S OPERATION about a month before. By making a very long anterior flap a cicatrix had been obtained about an inch and a half above the end of the stump.

Dr R. W. Forest showed a young woman with defective hearing on the left side, the result of an EXOSTOSIS blocking up the meatus. Deafness was first complained about three years ago, and for the last two years patient had suffered much pain in the left side of the head and face, which came on at intervals of two or three weeks. At no time had there been suppuration from the ear. The tumour, evidently of bony consistence, arose from the posterior wall of the meatus, and nearly formed a complete obstruction, but a probe could be passed between it and the anterior wall. On satisfying himself of the nature of the case, Dr Forest placed the patient under the care of Dr Cassells, who reported that the watch could only be heard on close contact, but that low clear speech could be easily heard. He considered that the middle and internal ear and auditory nerve were unaffected, and supposed the growth be an exostosis and not an hyperostosis due to inflammatory action. As the symptoms were not urgent he advised delay; but if irritation arose from the growth he thought electrolysis might be tried, as preferable to perforation.

Dr George Buchanan considered that the case came within Syme's category of aural cases which could be treated by general, as distinguished, from special surgery. He thought an exostosis might be removed from the auditory meatus just as from the tibia, and that, as it would no doubt become larger, it should be dealt with at once. Under chloroform a gouge and hammer might be safely employed for this purpose.

Dr Joseph Coats showed two preparations of DISEASE OF THE VERMIFORM APPENDAGE. In the first there had been acute inflammation of the appendage, resulting in an acute general peritonitis, the original inflammation of the appendage being caused apparently by the existence of a concretion of about the size and shape of a cherry stone, and composed of inspissated faeces. The case was somewhat interesting in a clinical point of view, as the patient presented symptoms strongly suggestive of internal obstruction, as strangulated hernia was suspected, but enemata had been successfully employed to move the bowels. The other case was one in which the vermiform appendage had been converted into a large cyst, measuring five inches in its long diameter. The cyst contained a tenacious colloid material, and the wall was thick and firm.

Dr George Buchanan showed a MAMMARY TUMOUR which had been removed from a patient. It had grown very rapidly, and, from its softness, had been supposed by the surgeon in attendance to be an abscess; under this supposition it had been incised, and in consequence a mass of the tumour protruded from the wound. As it was now regarded as malignant, the breast was excised; but, on cutting up the tumour after the operation, Dr Buchanan saw that it was not a regular scirrhus, and, indeed, he had at first some doubt as to whether it might not be a softened fibro-cellular

tumour. He desired the opinion of the members regarding the sections under the microscopes.

Dr Joseph Coats said that the microscopic structure seemed to him to show that it was undoubtedly a case of cancer. There were the usual collections of epithelial cells and coarse stroma. There was not the usual fibrous structure of scirrhus, and there seemed no objection to call it a case of soft cancer of the mamma. There was no essential distinction between scirrhus and soft cancer, and intermediate forms are met with. The distinction is only a practical one, and where, as here, we have a soft tumour presenting the cancerous structure, it seems natural to call it soft cancer.

Dr Reid regarded the epithelial structures found in this, as in some other mammary tumours, as simply an increased development of the epithelium existing normally in the acini. The stroma of the gland was infiltrated with oval-shaped granular cells or nuclei, eminently characteristic of encephaloid tumours.

Dr Joseph Coats showed a DUODENAL ULCER perforating a large artery. The ulcer was situated just beyond the pylorus, and measured about an inch in diameter. It had perforated the whole thickness of the wall of the duodenum, and its base was formed of pancreatic tissue. At about the middle of the base, an artery, the size of a crow-quill, was opened into, and was found on examination plugged by a clot. The artery was afterwards made out to be one of the branches of the hepatic artery.

FOURTH MEETING, December 8th, 1874.

Dr Hector C. Cameron showed a limb which he had recently removed for ACUTE NECROSIS of the whole shaft of the tibia of a boy.

Mr W. J. Fleming showed a tumour of the mamma, which he considered to be a CYSTO-SARCOMA.

Dr McCall Anderson brought forward a case of MEDIASTINAL TUMOUR, and exhibited the patient, now in the Western Infirmary.

The following report was read:—

T. M., 41, iron moulder, admitted November 11th, 1874, suffering from cough and expectoration of 12 months, spitting of blood of 6 months, and swelling of the neck, with dyspnoea, of 3 months' duration.

From the age of 14 to 24 he worked as a iron-moulder; he was then in the army for 12 years. All this time his health was good. At 36 he returned to his former occupation, which was laborious, and exposed him to alternations of heat and cold. Twelve months ago a slight dry cough set in, accompanied in a few weeks with expectoration, which gradually increased, and during last 5 months had contained blood. Three months ago he first experienced giddiness, oppression, and sense of suffocation on violent exertion or stooping, especially in lifting weights, relieved by resting in the erect posture, on stooping or coughing his sight becomes dim. For the last year he has felt a dull pain in right breast and shoulder, at times aggravated by hard work. These symptoms, together with increasing swelling of the neck, compelled him to give up work three weeks ago. While in the army, and for several years afterwards, he indulged freely in stimulants.

Patient was then exhibited, and on his withdrawal,

Dr Anderson said the case was interesting on account of the rarity of the disease, and also of the peculiarity of some of the symptoms. Patient was a fine, healthy-looking man, and yet pulmonary symptoms, cough, the red current jelly expectoration, dyspnoea on exertion, at the right apex defective movement, dulness on percussion and increased resistance, tubular breathing and increased vocal resonance, were present. All this might be supposed to indicate phthisis, but the more important general symptoms, emaciation, night sweats, diarrhoea, &c., were absent, and on looking further it was found that the dulness extended beyond the left margin of the sternum—enough in itself to show that it could not be due to consolidation of the right lung. Then there was feeble breathing at the right base posteriorly, and yet no dulness over this portion of lung; indicating some obstruction to the entrance of air into the bronchi. Again, the marked dilatation of the superficial veins of the face, neck, and upper arm of right side, pointed to obstruction of the circulation in these parts; and the distress experienced on coughing or stooping might be referred to an increase of this obstruction by such actions. The swelling of face, neck, and upper part of chest, which was found to be really due to œdema, also tended to prove that some such obstruction existed. Further, on carefully testing the pulses, it was found that the right radial pulse was distinctly weaker than the left. This fact might suggest the possibility of aneurism, but there was neither murmur, pulsation, nor purring tremor to be detected. Putting all these facts together, the diagnosis seemed to be pretty clear that the symptoms in this case were due to the presence of a tumour in the mediastinum—a conclusion which would be supported by reference to the report of a similar case published by him in the *Glasgow Medical Journal* for February, 1872, in which many of the same symptoms were observed. As to the nature of the tumour, the fact that patient had venereal disease 20 years ago (said to be Gonorrhœa with Bubo), the marked enlargement and induration of glands in the groin, with slighter adenopathy in the arms, and the appearance lately of a node on right tibia, attended with nocturnal pain, suggested a syphilitic origin in this instance. The treatment consisted of rest, with alleviation of special symptoms at first, and on the appearance of the tibial node patient was put on Iodide of Potassium and Iron, which certainly had the effect of reducing the swelling, dyspnoea, and cough, and the nocturnal pain in the leg. It should also be noted that patient had a well-marked, true cheloid tumour, situated at mid-sternum, and said to be congenital.

Dr George Buchanan exhibited a specimen of COLLOID TUMOUR of the mamma, which he had recently removed from an old lady aged 70. She had noticed the tumour about six months before he saw it, since which it had grown considerably. The operation was attended with success, in so far that the wound cicatrized in three weeks, and no trace of the disease was then apparent. The tumour was about the size of an American apple, elastic and circumscribed by an envelope of condensed areolar tissue, septa of which divided it into lobules. To the naked eye it had the appearance at the circumference of very firm jelly, of a pale pink colour; while toward the centre it was exactly like the pulp of a grape.

Dr Thomas Reid described the microscopical appearances. At the periphery there were collections of epithelial cells in alveoli composed of connective tissue. Nearer the centre there was a gradual conversion into the proper colloid structure. The colloid substance, he considered, was developed

from the connective tissue, the epithelium being surrounded by the colloid and gradually disappearing.

Dr Joseph Coats believed the structure at the periphery to be cancerous, the epithelial cells in the alveoli being almost typical. He also considered that it was by the conversion of these epithelial or cancer cells that the colloid material was formed; the peripheral cells first degenerating and then the more central ones.

Dr Perry exhibited a MALIGNANT TUMOUR removed *post mortem* from the surface of the chest of a female 36 years of age. The tumour had occupied the region of the chest, extending from the outer margin of the mammary gland to the axilla on the left side. It had commenced nine months since, and was first seen by a surgeon in Paris, who had diagnosed it as a simple tumour, and recommended no surgical interference. A similar opinion was given shortly after by Erasmus Wilson in London. The tumour increased in size, and became an open sore about four months since. The spongy fungous centre of the tumour gradually sloughed out, and left its centre deeply excavated to within a few lines of the outer surface of the ribs. Frequent hemorrhage took place from the ulcerated surface, which was easily checked by the use of the Perchloride of Iron. The edges of the tumour had an indurated and schirrous-like feeling to the touch, and were everted towards the lower border. The tumour measured in diameter $5\frac{1}{2}$ inches. The mammary gland was sound, the cervical glands were not enlarged, and the axillary glands were not affected until within three weeks of the patient's death, when they began to enlarge slightly. The patient sank from exhaustion, but did not suffer any great amount of pain. Her body was greatly emaciated. Sections of the tumour, prepared by *Mr W. Fleming*, were exhibited under the microscope.

Dr Joseph Coats was of opinion that the case was one of soft cancer. The stroma was distinct and the cells small, but of very various shapes.

Obituary.

THE LATE JOHN MURRAY, M.A., M.D.

JOHN MURRAY was born at the farm of Causewayend, Wigtonshire, in the year 1835. Very soon after John's birth the family removed to a farm in Argyleshire, remote from schools, so that his elementary education was almost entirely got at home, under the care of his father, who, although a farmer, had been brought up to the law, and was a W.S. In the master of a parish school some miles off he found not only a teacher, but an interested friend, who taught him Latin and Mathematics, recognising in his pupil that liking for the latter branch which came out so remarkably in his college career. He went up to Glasgow University, in November, 1850, to begin that stereotyped course in Arts which precedes entering the Hall, for like

many Scotch country lads of good parts, young Murray had been devoted by his mother to the church.

Now began the happiest and most successful period of John Murray's life, full of hard work, but full also of the delights of work in pleasant company, and on paths which soon opened out on those wide plains of applied science where his heart was to the last, and where he left the few traces of his life which yet remain. Murray had no great talent for languages, and his name did not appear in the University Prize Lists until he reached the Logic, Session 1853-54, but from that time until he graduated in Medicine, with the exception of the broken session in which he began Divinity, it is never absent altogether. In Mathematics he took the first prize. In Natural Philosophy he obtained a good position in the Prize List, but devoted himself more particularly to laboratory work under the directions of Prof. Thomson, who was just then beginning that remarkable series of discoveries and inventions in applied electricity which have since made his name famous, and have so much advanced the use of electricity in deep-sea telegraphy. In the Bakerian Lecture delivered by Prof. Thomson before the Royal Society in 1856, John Murray is mentioned with thanks as having carried out the experiments on the Electro-dynamic Qualities of Metals, and on the Conductivity of Copper Wires on which it is based. Sir William first discovered that copper wires, apparently the same, had most marked differences in electric conductivity, and therefore in commercial value for telegraphic purposes. Murray made the experiments which proved this, and which established a commercial test now in use.

At the end of the session 1855-56 he took the degree of M.A. with "honourable distinction in Mathematics and Natural Philosophy." Next session he entered the Divinity Hall, but broke off attendance abruptly. A misunderstanding with one of the professors was the immediate occasion, but he had received in the Natural Philosophy a bias towards physical research which certainly, sooner or later, would have diverted him from the Church. He took refuge in the laboratory, and in the beginning of 1857 was recommended by Professor Thomson to a company then about to lay a telegraph-cable from Sardinia to Malta and Corfu. He superintended the manufacture of the cable, and during the laying of it acted as electrical engineer. He returned just as the session 1857-58 was closing, to find Professor Thomson deep in his preparations for the second Atlantic Cable expedition. He at once secured Murray's services, and took him to Devonport to assist in testing the cable, which was there being put on board ship. They were soon joined by Mr Macfarlane, the permanent assistant to the Professor of Natural Philosophy, and by William Anderson, James Morrison, and James B. Russell, students selected from the laboratory experimenters. Up to the sailing of the expedition, testing and experimenting with various forms of communicating instrument scarcely ceased night or day. Professor Thomson was then groping his way to that series of ingenious and beautiful inventions which have since been successively

patented, without which deep-sea telegraphy would have been deprived of half its present facility, if it would not have been quite impossible. On that occasion the cable was conveyed by two ships of war—the American frigate *Niagara*, and the British man-of-war *Agamemnon*—and the manner of laying was by splicing in mid-ocean, each vessel sailing towards her own side of the Atlantic. Those who were engaged in this expedition, and remember the storm which they encountered, and the behaviour of the *Agamemnon* with her dead weight of cable, so graphically described at the time by the *Times* correspondent, will feel that they have reason to be thankful that the ribs of a three-decker were opposed to the strain, otherwise the fate of the crew and electrical staff of the *La Plata* would have undoubtedly been theirs. Murray accompanied the *Niagara*, and landed in Newfoundland with the cable, where he remained for some weeks until communication became impossible, and so his occupation was gone.

During the voyage a “fault” was discovered in one of the coils of cable on board the *Niagara*, but it was so minute that the modes of testing then known were unable to fix its position, and so to permit of its repair. Stimulated by the emergency, Murray worked out a new test on the spot, which is described in Clark and Sabine’s “Electrical Tables and Formule for the use of Telegraph Inspectors and Operators,” as “Murray’s Loop Test,” and continues to be the best method of discovering the seat of faults of small extent. On this frail fragment, therefore, his name will float, and for a time remain under the eyes of men.

Had the Atlantic Cable of 1858 succeeded, it is probable the course of Murray’s life would have been determined towards marine telegraphy, but, as it was, he began the study of medicine in November. His career as a medical student was brilliant, not so much from his achievements in the medical classes, as from his continued appearance as a gainer of University prizes for essays on physical subjects. Three times (twice consecutively) he carried off “The Watt Prize” for Essays on “The Economic Production of Mechanical Work from Chemical Forces,” on “The Laws of the Mutual Interpenetration of Fluids,” and on “Electro-Chemistry in the Arts.” The like had not been done before, and has not been done since. These successes reflected a credit on his purely medical career, and, combined with the substantial nature of his work in all his classes, and the ready grasp of his trained mind on all subjects, made his position high in the esteem, both of professors and of students, who made him President of the University Medical Society for one year. Chemistry seemed to interest him most, as being most related to his favourite branches of Natural Philosophy, Electricity and Dynamics. In Descriptive Anatomy he took the first place, in all the other classes either the second or third. He was permitted to graduate in three years, and in 1861 he took his M.D., with the second prize for general efficiency.

In 1860 Murray entered the Town’s Hospital as Resident Assistant, and remained there for some months after he had graduated. The following,

by Dr Robertson, the principal Medical Officer, gives a good idea both of his character as a student and his professional ability:—"Besides his classes and his duties in this establishment—no sinecure appointment, let me say—he held the office of President of the Medical Society in College, and was a Member of the University Company of Volunteers. This was more than most men could have gone through; but his capacity for work, both physical and mental, was very great, and all that he undertook was at least creditably performed. He was quick at apprehension, ready of resource, prompt at decision, and had a firm grasp of any subject to which he directed his attention. He had a thorough knowledge of his profession in all its branches, to the extent it was possible for a student to acquire at that time in Glasgow, and he availed himself of every opportunity in this hospital of increasing his practical acquaintance with disease, both by careful examination of the living and inspection of the dead. He did not manifest a predilection towards any special department of medicine or surgery; but the dexterous, cool, self-reliant manner in which he performed the minor operations which fell to him, gave every promise of a brilliant career as a surgeon in after life. Unfortunately, however, it was his lot to fall into a country practice, from which circumstances did not permit him to remove, and there it was difficult to follow the bent of his inclination, either in that or any other direction. My intercourse with him was very intimate, as we dined at the same table. This led me to form a high estimate of his natural endowments, both of heart and mind, and also of his philosophic culture and general intelligence. He was a warm, true friend, and never thought of sparing himself if, by exertion of his, he could assist any one in whom he was interested."

The somewhat sad allusion made by Dr Robertson to Murray's "fall into a country practice," introduces us to the next stage of his life. We have all felt the depressing reality of that day following the acquisition of our degree, when the question arises, "What will he do with it?" We are tempted to say that it is well for a young man in those circumstances, if he has only his own professional interests to consult, but after all there is a unity in the individual life. If we find golden fruit on a tree, it is not well to quarrel with the knots on its trunk and the stunted development of some of its branches. We are too ignorant of the vital connection between the one and the other. Murray's affections were, early in his student life, attached to a lady, whose love presided over those wayward days with a pure and elevating influence. With her interests at heart he could not brave the risks and long delay of a battle for professional position in Glasgow. After an attempt to make a marriageable practice in Wigtownshire, he entered into a more promising engagement with an old practitioner in the village of Wickham, Hampshire. In July, 1864, his happiness was perfected by his marriage, and he subsided into a country practice with but limited possibilities of extension. Towards the premature close of his life he became restless, feeling his aspirations and potential activities ringed

about by the iron necessities of his family, which would not permit the risks of change. When he took a holiday he always repaired to Glasgow, and snatched the short enjoyment to be had from a visit to the Old College and the scene of his former triumphs—the laboratory of the Natural Philosophy class. In August 1874 he was attacked with his final illness. He was advised to go north, which he did, and visited a relative in Argyleshire, but without improvement. He seems to have had a presentiment of the issue, as he longed to get home to Hampshire, whither he went, obtaining the highest professional advice *en route* in Edinburgh and London. But the end had come. After much suffering, patiently borne, he died on the 16th September, aged 39, leaving his young wife with four children. His remains now rest in the quiet churchyard of the village of Wickham.

In stature, Murray was of middle-size, and in body compactly built and wiry. His face was small and, like his frame, firm of feature, with a shrewd, alert expression, softened by a kindly eye, and lips compressed by habit but ready to relax into a smile. His carriage was erect, and his movements rapid, indeed, nervous. The man within was wonderfully typified in those corporeal characteristics. He was not brilliant, but he was sound and thorough, a vigorous and accurate thinker. Mathematics to him were not so much wings with which to fly to wide results and anticipate experiment, as a tool which he could handle deftly in his daily work. He applied his knowledge with great readiness and directness in devising and carrying out physical experiments. Glasgow never sent from her medical school a graduate more highly accomplished in Natural Philosophy, both experimental and as a branch of applied Mathematics, than John Murray. Had fortune been more liberal in granting him opportunity no man could have worked out those problems in physiology which require a knowledge of physics and the aid of mathematics, better. He might have given some lustre to the reputation of the school in a department in which as yet it has little or none.

Although circumstances prevented Murray from getting credit for his intellectual attainments from more than the narrow circle of those who were his fellow-students and special intimates, nothing could hide the qualities of his heart from general observation. His temperament was sanguine, and this occasionally gave a boastful aspect to his representation of affairs; but he had a capital discernment of character, and having discovered an honest and lovable soul he clung to it; and though, in the business of this life, long periods might elapse without contact or communication, yet only approach him again and the old warmth would still be felt. He never thought of self if his exertions could benefit a friend. His heart leaped in sympathy with the sorrows and afflictions which befall most men at some time or another in their life.

Among Dr Murray's college friends and fellow-students were Joseph D. Everett, D.C.L., Professor of Natural Philosophy in Belfast, Professor Flint of St Andrew's University, and Sheriff Galbraith of Glasgow.

We shall conclude this hurried tribute to the memory of a very dear friend with a quotation from a letter from Professor Everett, who occupied the same lodgings as Murray for two years, and, therefore, knew him as only such intimacy at such a period of life will enable one man to know another:—"He was a real, good-hearted, kindly fellow, ever ready to lend a helping hand, and with excellent instincts to discern what was admirable and what detestable in human character. No humbug would go down with him, and he was not given to many words. His student work was thorough, and he would not pretend to know things unless he understood them. One curious habit he had, and which I never met with in anybody else, he used to talk mathematics aloud in his sleep."

Dr Murray published two very able papers in the July and October numbers of the *Glasgow Medical Journal* for 1861, upon the "Laws of the Mutual Interpenetration of Fluids," based on his Watt Prize Essay on that subject. His physiological application of those laws are a good sample of what he might have done for physiology had circumstances permitted. During his short stay in Newton-Stewart he contributed two papers to the volume for 1862 of the same *Journal*, on "A Case of Puerperal Pyæmia," and "A Case of Acute Phthisis, complicated with extensive Emphysema." His only other appearance in medical literature was also in this *Journal* for November, 1870, "On the Treatment of Carbuncle."

Medical Intelligence, &c.



CONGENITAL ABSENCE OF THE IRIS.—Dr George Reuling, of Baltimore, contributes to the current number of the *American Journal of the Medical Sciences* a short note on a case of congenital absence of the iris in both eyes, which had come under his notice. The subject of it was a young lady, seventeen years of age, who suffered from some weariness of the eyes after long reading. The lens was distinctly visible, and was crossed here and there by opaque linear striations, which, as a general rule, followed the direction of the lenticular fibres; these but slightly interfered with the power of sight. The lens was in its normal position, and its edge was clearly seen. The retina, optic nerve, and blood-vessels were quite normal. The eyes were emmetropic, Snellen's No. 1 being read at a distance of 10 inches; the range of accommodation was almost one sixth. During the accommodation for near objects the black lenticular margin was observed to grow broader; when the eye gazed at

distant objects it became narrower; thus proving that it moved from, and advanced towards, its *point d'appui*, and that the diameter of the lens underwent increase and diminution. The near point was determined to be about 4 inches, but when the eye was acted on by two grain solution of atropine, it was found to be 14 inches. The author considers that the case is another proof that the iris is not essential to accommodation, and (consequently) that the ciliary muscle is alone engaged in that act; the movements of the iris being, "exclusively to be looked upon as belonging to the class of 'associated' movements."

BERNARD ON FECUNDATION.—*M. Claude Bernard*, in his very interesting lectures, recently published in the *Revue Scientifique*, proposes an ingenious explanation for the well-known fact that the spermatazoa influence not only the ovum which they impregnate, but also, directly or indirectly, ova of the same female, subsequently, impregnated by the spermatie particles from other males. His experiments on the artificial fecundation of the ova of batrachians have convinced him that if an ovum receives stimulation from only a small number of spermatazoa its development is arrested, whereas, if the number is large, an impulsion is given to it which results in the maturation of the ovum, and the production of the offspring. "I think," he says, "that a certain number of ova receive an impregnation insufficient for the development of a new being, but sufficient, nevertheless, to leave an imprint on the ovule which a complement of fecundation develops later." We need scarcely remind our readers that this, in the case of mammalian females, implies the entrance of spermatie particles into the substance of the ovary, a somewhat improbable supposition.

COUGH AND SWEATING IN PHTHISIS.—*Dr Little*, of Dublin, recommends the following combination for the relief of the distressing cough of phthisis, and for diminishing the sweating:—

Acetate of Morphia, 2 grains.

Liquor of Atropia, 6 minims.

Dilute Hydrocyanic Acid, 36 minims.

Syrup of Virginia Prune to an ounce and a-half.

A measured drachm to be taken, unmixed with water, on going to bed, and once again during the night if necessary.—*Dublin Journal of Medical Science*, January, 1875.

JABORANDI.—*M.M. Ball and Hardy*, in a report read to the *Société de Biologie*, November 7th, 1874, note that during the administration of this remedy there is a very marked diminution of the amount of urea excreted by the kidneys. The amount of urea in the sweat is notably increased, but is not present in sufficient quantity to make up for the deficiency in the urine. Urea is also found in the saliva, but in such small quantity as not to be

estimable by the quantitative analysis. The general conclusion is, that less urea is actually excreted from the body during the sweatings due to jaborandi. This conclusion has, however, been called in question, in consequence of coffee having been administered to the patients on whom the observations were made, and of diminution of excretion of urea being one of the physiological results of coffee-drinking.

DR SEGUIN ON THE PHYSIOLOGY AND PATHOLOGY OF THE NERVOUS SYSTEM.

—*Dr Seguin* (*New York Medical Record*, Dec. 1), sums up an able outline of the physiology of the nervous system in the following propositions.

There are four generalised functions in the nervous system.

1. Sensation and perception are executed by means of paths which decussate almost horizontally in the spinal axis; the conduction being by the gray matter, not by the white columns of the cord; coarse sensibility with doubtful consciousness has its seat in the pons Varolii; perfect perception and appreciation is possible only with the help of the cerebral mass.

2. Motion is executed through motor impulses, which, starting from the opto-striate bodies (from cortex of cerebrum also?) traverse paths which decussate almost opposite the motor nerves as far down as the lower margin of the medulla oblongata, where the paths for the trunk and limbs decussate in a bundle, to remain, below this point, in that half of the spinal cord whence arise the nerves going to the muscles.

3. Reflex action is the result of a transformation of an irritation from the periphery into nervous force by a nerve-cell, transmitted centrifugally by a second nerve. That all nervous phenomena are of reflex mechanism, is not to be too positively denied.

4. Co-ordination is no faculty, but a function of every portion of the motor tract of the spinal axis from the origin third cerebral nerve down.

There are a few pathological laws logically allied to the physiological propositions enumerated above, which I wish to submit.

1. Any disease of any part of the nervous centres may produce two kinds of symptoms, which we should always attempt to distinguish, these being symptoms of irritation, consisting, according to the location of the lesion, in exaltation of ideas, delirium, in numbness, pain, and in spasmodic movements; and symptoms of destruction of parts, loss of mental power, anaesthesia, paralysis. Brown-Séquard was, I believe, the first to insist upon the exceeding importance of distinguishing these two classes of effects.

2. It should be borne in mind that irritating lesions may cause the second class of symptoms by producing an inhibitory (arresting) effect upon centres near or distant.

3. Ischemia of the nervous centres produces extreme irritation symptoms, delirium, spasms, pain, and numbness, followed by loss of function of parts.

4. The effects of hyperæmia are not satisfactorily known.
5. A want of equilibrium in the circulation of both hemispheres is a common cause of vertigo.
6. Almost any lesion of the nervous centres may disturb the nutrition of distant (non-nervous) tissues.
7. A generalised lesion of the convulsions of the brain produces, first exaltation of mind and emotions, followed by abolition of the faculties, and a false general paralysis.
8. A lesion of one cerebral hemisphere gives rise to symptoms (paralysis, numbness) in the opposite side of the body and face. The localisation of the lesion in the left hemisphere about the fissure of Sylvius, is exceedingly likely to abolish language spoken and written; while lesions of the right hemisphere produce more severe palsy, set the emotions free, and endanger life more.
9. A lesion of the centre of the pons Varolii will produce general paralysis, with probably anæsthesia and changes in the bottom of the eyes.
10. A lesion in one-half of the pons Varolii will produce palsy with (probably) anæsthesia in the opposite side of the body.
11. Lesions of the cerebellum when in one lobe produce an incomplete hemiplegia on the opposite side, with marked eye and stomach symptoms.
12. A suddenly produced lesion of the centre of the medulla oblongata will probably kill the patient at once by arresting respiration.
13. A lesion localised in one-half of the medulla oblongata will give rise to hemiplegia and anæsthesia on the opposite side.
14. A lesion at the base of the brain, not on the median line, will produce a crossed palsy (as first indicated by Romberg); palsy of the body on the side opposite the lesion, and palsy of one or more cranial nerves on the same side as the disease.
15. Pressure anywhere within the skull may affect the nutrition of the optic nerves.
16. In lesions of the cerebral hemispheres accompanied by coma (apoplexy), the eyes are together turned and fixed towards the side of the lesion, and away from the palsied side.
17. A lesion occupying the whole thickness of the spinal cord, or its grey matter, will give rise to palsy of all parts below the lesion, *i.e.*, below the distribution of nerves issuing from just above the lesion; and such a paraplegia is necessarily attended by anæsthesia, and increased reflex movements in palsied parts.
18. A lesion in one-half of the spinal cord (hemi-section, Brown-Séquard), at any point will produce paralysis with hyperæsthesia on the same side as the lesion, and anæsthesia on the opposite side.
19. A lesion involving the posterior columns of the spinal cord produces neuralgia and ataxia of movements.
20. A lesion affecting the lateral columns of the spinal cord will cause a paralysis accompanied by contracture.

21. A lesion of the cells of the anterior horns of the cord alone will produce a palsy (no anæsthesia), accompanied by extreme wasting of muscles, and loss of electro-muscular reaction. Any part of the spinal axis may be seat of this disease.

22. A lesion (destructive) of nerve-trunks gives rise to a paralysis with anæsthesia, and rapid loss of electro-muscular reaction.

23. A lesion in the cerebrum and the opto-striate bodies may produce secondary lesions in the spinal cord and nerves.

24. A lesion of the spinal cord may cause secondary lesions upward and downward in the cord, and in nerves.

25. Lesions of nerve-trunks may produce secondary lesions of the spinal cord.—*London Medical Record*, Dec., 1874.

KOUMIS.—Landowski contributes several papers to recent numbers of the *Journal de Thérapeutique*, wherein he gives an elaborate history of this recently introduced remedy, and discusses its properties and uses. He attributes the good effects derived from the use of this medicine to—

1. The action on the organism of a great quantity of salts identical with those of the serum of the blood.

2. The action of proteinaceous matters on the tissues.

3. The high digestive power of lactic acid.

4. The stimulant action of alcohol and its influence on adipose tissues generally.

5. The stimulant properties of carbonic acid on the capillaries, and its sedative action on the gastric mucous membrane.

6. The permanent state of fermentation of koumis, which may be considered as one of the principal causes of its direct and rapid action.

Koumis has been administered in cases of pulmonary tubercle. Under its influence, sleep returned, the fever was abated, the pulse became full and moderate, the cough was diminished, the expectoration from being muco-purulent became mucous, the appetite improved, and the weight increased. Of 100 cases of tubercle treated in this manner, Bogojalewski states 15 as cured, 70 as having their condition notably ameliorated, 10 as being not at all benefited, and 5 deceased. Of 40 cases observed by Landowski he reports there were good results in 30.

Koumis has been employed also in albuminuria, diabetes, chlorosis and anæmia, gastritis, and dyspepsia.

The duration of treatment is at the least six weeks; the quantity taken varies from one to four bottles a day. The two kinds of koumis employed in therapeutics differ only in the degree of fermentation.—*Revue des Sciences Médicales*, Jan., 1875.

PINCUS ON THE TREATMENT OF TAPEWORM.—At a meeting of the Berlin Medical Society held on October 28, 1874, (*Berliner Klinische Wochenschrift*, November 30), Herr Pincus remarked that many medical

men consider a preparatory treatment necessary before administering anthelmintics. This preparation consists of oils and low diet for some days beforehand, or two or three days' physicing, which irritates the worms. The consequence, he states, is that when the anthelmintic is given, portions only of the body, and not the head, are expelled. The remedies may be divided into two classes, namely, those which paralyse the movements of the proglottides, kusso, panna [the rhizome of *Lastrea* (*Aspidium*) *athamanticum*, much esteemed by the Zulu Caffres, and somewhat resembling our male-fern], kameela; and those which act upon the organs of adhesion, as the bark of pomegranate-root and male-fern. Whichever be employed, the best result is obtained by giving a full dose without any preparatory medication. Again, it has been advised, when the worm is found to protrude from the anus, to do nothing except let the patient sit over warm water; this may be done for hours, and the consequence is, that after from eight to ten feet of worm have come away, there is no further progress; probably because the head is not paralysed, and remains adherent, whilst the proglottides come away. In such cases Dr Pincus gives a narcotic clyster, if the movements of the worm be lively; and then, in less than an hour, even when the tapeworm is broken, he has found the head to come away. The older remedies, such as pomegranate-root bark, are preferable, because they do not much derange the patient's health. Professor Henech remarked that narcotic clysters, even with chloroform, had been recommended some time since. He asked if Dr Pincus had himself experimented upon the worms. Dr Pincus said that he meant substances which narcotised the worms themselves, particularly pomegranate-root bark. He had made experiments upon the proglottides passed by patients; the movements of these ceased immediately when subjected to kusso, panna, or kameela. He had made no direct experiments on the action of the other remedies in paralysing the adhesive organs. Professor Leibreich drew attention to the koussine or koussein prepared by Bedal, of Munich, which was not an alkaloid, but contained the resin of kouso. Two grammes of this preparation have the same effect as twenty grammes of kouso (5ss koussine is equal to 3v of kusso.) Herr Paasch had also used pomegranate-root bark, but considered no cure as complete unless the worm came away *suâ sponte*. Professor Henech denied that the passing of proglottides denoted the worms being themselves out of health; the proglottides severed themselves when sexually ripe, in order to pursue their farther transmigrations. Herr Furstenheim mentioned the thick lozenges prescribed by Rossenthal as very convenient in practice. They contained kouso. Herr Pincus believed that the proglottides become separated, when the fibres which connect them are so softened and worn that the alkaline mucus of the bowels dissolves them.

—*London Medical Record*, Jan'y. 6th, 1875.

SEX IN OCCUPATION.—It is questionable whether at any time it is right or politic for authority to interfere with or check the aspirations and actions

of individuals, always premising that their desires and doings are not criminal or injurious to the public. If a man chooses to attempt to fly he should be allowed to do so, provided he takes care not to fall upon and maim or destroy his less venturesome brothers. The laws of gravitation will most certainly eventually decide the question, and bring the experimentalist to his senses or his grave. If the latter, it will not be a life altogether lost, for others will thereby be deterred from following his example, and ingenuity will be diverted into a more useful direction. Of the thousands of occupations open to the human race, it must sometimes be difficult to determine which naturally belong to women and which to men. A certain number of ladies are now in doubt upon this subject, and are anxious to ascertain how far they are capable of filling the higher intellectual positions hitherto held by gentlemen. No logical reason can be given why they should not be permitted to make the attempt. Although they have on an average four ounces less brain than men, still it is certain that some women have a larger cerebral development than many men. No just cause or impediment can therefore be urged why they should not be allowed to use the mental power they possess in any direction they please. There is in England a large surplus female population. It is said, if they were to join hands and stand in a line, they would reach from Edinburgh to London. With our present monogamous system it is impossible that all these can become what they were doubtless intended to be, the reproductive servants of our race. Many of them, therefore, are not only justified in keeping their reproductive functions in abeyance, but are compelled to do so by law. Some occupation must be found for these women. If they have no children to produce, rear, and educate, no home to rule and no husband to love, they may wisely expend their brain power in some other course. At a meeting of convocation of the University of London, held last month, a majority of the gentlemen voting advised that women should be permitted to take degrees. Should the senate sanction this recommendation the learned professions will virtually be opened to the female sex, and we may expect in time to see prime ministers, bishops, judges, and physicians in ordinary to majesty in petticoats. There is, however, one reason why this anticipation is not likely to be fulfilled. Women have ever been devoid of genius, that is, of the higher creative faculties. Poets, painters, musicians, engineers, &c., are as a rule of the male sex. There are exceptions, but they can be easily counted. It is idle to attribute this to lack of education. Genius, in spite of poverty or want of instruction, seizes its owner and raises him or her high above those whose advantages have been ever so great. All ladies are taught music: yet the fact remains that our best composers are men. Cooking and dressmaking are essentially women's employments, and still the best artists in these occupations are men. Power has been equally conferred upon the sexes. How weak is man before a woman's beauty and capability of giving pleasure. Had she also

been given physical strength and masculine intellect she would have been supremely dominant, excelling men in heroism, science, and art as much, and even more, than she exceeds them in numbers. Men would have been completely outwitted and outvoted by her. They are sufficiently her slaves now. What abject serfs would they not have become? Fortunately, however vigorously and persistently we may endeavour to alter the equilibrium between the sexes, it cannot be permanently destroyed. Beauty and gentleness will ever be woman's attributes, genius and strength will be man's. The veil and the fan will always be emblematic of one sex, the laurel and sword of the other. If it were possible it would be an excellent plan to allow every man and woman to endeavour to fulfil the particular mission to which he or she feels most strongly inclined. If a man wishes to be a monthly nurse or a woman a police constable, by all means let them try. Deny them this privilege, and you create a grievance. Permit the experiment, and in a few days the question is settled. The women who are now seeking admission to masculine professions should, if they are inclined to work and pay, be permitted to prove how far they are able to compete with men. This would put an end to the ceaseless and wearying agitation that is constantly eating up thought and energy, which might be better employed. It would convince aspirants of the preposterousness and futility of their aims, or it would show that they were right in the estimate they had formed of their powers. In the latter case our national and social positions would be strengthened by a welcome accession of fresh talent and help. In the former, those who had been working in a wrong groove would find out their mistake, and learn to use their powers in a more suitable direction. There would, of course, be great and probably insuperable difficulties in carrying out this recommendation; but we are convinced there will be no peace until it is attempted. The result of the experiment would probably show that the numbers of women who would avail themselves of the privilege would be, comparatively speaking, very small, and that those who did so would find after all that the present allotment of occupations to the sexes was not far from being the most suitable and congenial to their feelings and capabilities. When it has been determined what a woman's occupation is to be, then, and then only, can the question of her education be settled. This is but a means to an end. The woman who would love and nurture does not require the same mental training as she who would plead, preach, or practice medicine.—*Obstetrical Journal*, June, 1874.

DIPHTHERITIC SORE THROAT.—*An easy and successful method of treating it, by Dr Lelli.*—The following method of treatment has given similar results for many years, and the conclusions drawn by the author are as follows;—1. Never cauterize the throat or abstract blood; abstain from purgatives and emetics, unless in very exceptional cases.—2. Nourish the patient according to his appetite, but let the food be light and easily as-

simulated.—3. Keep up the functions of the skin from the very commencement of the disease till the local, or still better, the general symptoms allow you to judge that the morbid process is extinct. (Great stress is laid on this point.)—4. For local application, as well as for internal use, the author strongly recommends the following “antidiphtheritic mixture”:—Boiling water, $\bar{3}$ vi.-xx.; liquid sesquichloride of iron, min. xx.- $\bar{5}$ i.: carbolic acid, grs. iij.-xx.; red honey, $\bar{3}$ vi. This can be used internally and as a gargle every two hours: one or two spoonfuls being a dose. The results of this treatment in 60 cases has been—a mortality less than 2 per cent.; medium duration of the attack, 8 to 10 days; extension of disease to air passages rare and slight; and sequelæ, none or very rare.—*Repertorio Jalisciense*, Dec., 1874. *Lancet* Jan. 1875.

GLASGOW UNIVERSITY GRADUATES' CLUB.—The following is a copy of an appeal which is in course of circulation among the younger members of the profession in and around Glasgow. We heartily commend it to the attention of all former students of Glasgow University.

DEAR SIR.—The Medical Graduates of April, 1873, resolved at a Graduation Dinner (Professor Young, M.D., Chairman; David Foulis, M.B., C.M., President University Medico-Chirurgical Society, Croupier) to found a Glasgow University Medical Graduates' Club, and one of us was appointed to make the necessary arrangements. The objects of the Club are,—1. To have an annual dinner on the day of Graduation. 2. To keep an Album, in which the Photographs and Addresses of the Members shall be preserved; the List to be revised annually. 3. To raise a Fund, which shall be applied to the endowment of the University Medico-Chirurgical Society, so as to provide it with permanent Apartments in or near the University Grounds. We shall be glad to receive your name as a member of the Club; and hope to have your assistance in enlarging the Roll from among the former Graduates of this University. The Subscription has been fixed, in the first instance, at 5s; and a Donation List has been opened, so as to secure, the more speedily, the third object of the Club. We are—Yours very truly,—John Young, M.D.; John Glen, M.B.; Samson Gemmell, M.B. Subscriptions and Donations will be received by the Secretary, W. J. Scott, M.B., Western Infirmary; R. D. Pinnoch, M.B., Glasgow Royal Infirmary; Samson Gemmell, M.B., John Glen, M.B., or John Young, M.D., at the University.

BOOKS, PAMPHLETS, ETC., RECEIVED.

A Practical Treatise on Eczema, including its Lichenous and Impetiginous Forms. By Dr McCall Anderson, Professor of Clinical Medicine in the University of Glasgow, &c., &c. Third Edition: pp. 208. London: Churchill. 1874.

- The Pathological Anatomy of the Nervous Centres. By Edward Long Fox, M.D., F.R.C.P., &c., &c. With Illustrations; pp. 402. London: Smith, Elder & Co. 1874.
- Outlines of the Science and Practice of Medicine. By William Aitken, M.D., F.R.S., &c., &c., &c.; pp. 594. London: Charles Griffin & Co. 1874.
- The Forces which Carry on the Circulation of the Blood. By Andrew Buchanan, M.D., Professor of Physiology in the University of Glasgow. Second Edition; pp. 102. London: Churchill. 1874.
- Clinical Pocket-Book, an Aid to the Study of Clinical Medicine; for the Use of Students of the Manchester Royal Infirmary; pp. 30. London: Smith, Elder & Co. 1874.
- The Art and Science of Medicine; Introductory Address at Saint George's Hospital. By Dr Dickinson; pp. 40. London: Longmans. 1874.
- Dental Pathology and Surgery. By S. James A. Salter, M.B., F.R.S., Dental Surgeon to Guy's Hospital, &c., &c.; pp. 400. London: Longmans. 1874.
- On Defective Hearing, its Curable Forms and Rational Treatment. By James Keene, F.R.C.S., &c., &c.; pp. 72. London: Hardwicke. 1874.
- Cholera—How to Prevent and Resist it. By Dr Max von Pettenkofer. Translated (with Introduction and Appendix on the International Cholera Conference of Vienna) by Thomas Whiteside Hime, A.B., M.B., &c. With Illustrations: pp. 76. London: Bailliere, Tindall & Cox. 1875.
- A Treatise on Food and Dietetics. Physiologically and Therapeutically considered. By F. W. Pavy, M.D., F.R.S., Physician to, and Lecturer on, Physiology at Guy's Hospital. pp. 560. London: Churchill. 1874.
- Qualitative Chemical Analysis and Laboratory Practice. By T. E. Thorpe, Ph.D., F.R.S.E., Professor of Chemistry, Andersonian Institution, Glasgow, and M. M. Pattison Muir, F.R.S.E. pp. 240. London: Longmans, Green & Co. 1874.
- Sanitary Arrangements for Dwellings, intended for the use of Officers of Health, Architects, Builders, and Householders. By William Eassie, C.E., &c., &c. pp. 188. London: Smith, Elder & Co. 1874.
- An Epitome of Therapeutics, being a Comprehensive Summary of the Treatment of Disease as recommended by the leading British, American, and Continental Physicians. By W. Domett Stone, M.D., &c., &c. pp. 360. London: Smith, Elder & Co. 1874.
- On Hospitalism and the Causes of Death after Operations. By John Eric Erichsen, F.R.C.S., Professor of Clinical Surgery in the University College. pp. 108. London: Longmans, Green & Co. 1874.
- A Clinical History of the Medical and Surgical Diseases of Women. By Robert Barnes, M.D., Obstetric Physician and Lecturer on Obstetrics and the Diseases of Women to St Thomas' Hospital. pp. 916. London: Churchill. 1873.

- Three Years' Surgical Work in the Manchester Royal Infirmary. By Edward Lund, F.R.C.S., Surgeon to the Hospital. pp. 100. Manchester : Cornish. 1874.
- The Questions of Aural Surgery. By James Hinton, Aural Surgeon to Guy's Hospital. pp. 308. London : H. J. King & Co. 1874.
- The Essentials of Materia Medica and Therapeutics. By Alfred Baring Garrod, M.D., F.R.S. Fourth Edition, revised and edited, under the supervision of the Author. By E. Buchanan Baxter, M.D. London : Longmans, Green & Co. 1874.
- The Pathology and Treatment of Diseases of the Ovaries. By Lawson Tait, M.D., &c. London : Smith, Elder & Co. 1874.
- Nomenclature of Diseases. Prepared for the use of the Medical Officers of the U.S. Marine Hospital Service. By the Supervising Surgeon (John M. Woodworth). Washington. 1874.
- The Harveian Oration for 1874. By Charles West, M.D. pp. 64. London : Longmans, Green & Co. 1874.
- Free Phosphorus in Medicine, with special reference to its use in Neuralgia. A Contribution to Materia Medica and Therapeutics. By J. Ashburton Thompson, M.D. pp. 276. London : H. K. Lewis. 1874.
- The Maintenance of Health ; a Medical Work for Lay Readers. By J. Milner Fothergill, M.D., &c., &c. pp. 400. London : Smith, Elder & Co. 1874.
- Notes of Demonstrations in Physiological Chemistry. By S. W. Moore, Joint Demonstrator of Practical Physiology at St George's Hospital Medical School. pp. 58. London : Smith, Elder & Co. 1874.
- The West Riding Asylum Medical Reports. Edited by J. Crichton Browne, M.D., F.R.S.E. Vol. IV. pp. 318. London : Smith, Elder & Co. 1874.
- On Functional Derangements of the Liver. By Charles Murchison, M.D., F.R.S., &c., &c., &c. pp. 182. London : Smith, Elder & Co. 1874.

CORRECTION.

In October Number, p. 556, 10th line from bottom, for "Glasgow" read "London."

THE
GLASGOW MEDICAL JOURNAL.

April, 1875.

Original Articles.

I.—LECTURE ON THE COURSE OF THE TEMPERATURE
IN DEFERVESCENCE.*

By JAMES FINLAYSON, M.D., *Physician to the Glasgow Western Infirmary.*

ON looking at a series of charts representing the course of the temperature in various diseases, you might suppose that everything is stamped upon them so plainly that, after you have mastered a few general ideas as to the mode in which certain febrile diseases begin and terminate, you have obtained from thermometry all the assistance it can afford. But when you leave the study of books and the general doctrines of disease, to grope for yourselves in the midst of obscure febrile disorders, all this may seem changed. The charts on which your teaching has proceeded are usually selected from their being, in some sense, typical: the diagnosis in such cases is surely established, and the course of the temperature is traced, through complications it may be, to a termination either favourable or otherwise. But you will find that you often have recourse to your thermometer, most anxiously, in exactly opposite circumstances; namely, in the beginning or at the height of an obscure disease, whose diagnosis you have not yet established, and the progress of which may

* Delivered at the Western Infirmary, March 23, 1875, illustrated by diagrams.

present certain departures from the usual course. Let us imagine ourselves anxiously watching the course of a febrile disease when a crisis is expected, or when deferrescence may seem to have begun, and consider what fallacies may beset us in such circumstances.

So long as the febrile temperature persists the disease still continues, but a fall of the temperature is not necessarily a favourable prognostic.—In the case, for example, of basilar meningitis the temperature is seldom very much elevated, and, indeed, a marked diminution from the previous heights of a tubercular fever may sometimes be seen when the cerebral symptoms begin to assume a special gravity. In such a case the fall of the mercury amidst deepening cerebral symptoms is only to be regarded as an evil omen—the local mischief in the brain seems to have some controlling influence over the general temperature. But even in tubercular fever, apart altogether from any brain mischief, the natural termination may be, as you have seen this session, by an absence of fever for two or three days before death: thus, while a too exclusive reliance on the indications of the thermometer might lead you to give a favourable opinion of the actual condition of the patient, the depression of temperature on which you were founding might only be due to the failure of the vital powers. Such depressions, however, do not necessarily imply a fatal issue; they may occur several times in the course of an advancing disease, or they may possibly be associated with a distinct, though temporary amendment.

In pneumonia, again, although the usual course of a fatal case is to attain a maximum before the termination in death, there may be, exceptionally, a low temperature preceding this event, either continuing on till the end, or giving way to a terminal exacerbation. A depression of the temperature to the degree of collapse may be associated with severe intestinal hæmorrhage in enteric fever, or possibly even with perforation of the bowel, and this depression may, perhaps, be the earliest indication of such accidents. A great diminution may likewise follow other forms of bleeding (remedial

or otherwise), and it is sometimes associated with the act of vomiting, or with a profuse discharge from the bowels. In all these cases we have examples of a marked fall of the temperature, none of them likely to result in a true crisis, and some of them indicative of much danger, or even of almost certain death. As a set-off against this you must remember that the occurrence of a collapse temperature, even although it does not inaugurate the true crisis, and may be immediately succeeded by a higher fever than had been previously reached, may still be of no evil omen, and may, indeed, constitute one of those critical perturbations which not unfrequently pave the way, as it were, for a genuine crisis within 24 or 48 hours. Even when we are satisfied that the great diminution of temperature recorded is the beginning of a veritable and definitive defervescence, such a state of depression may exist in the patient as to call for extremely careful treatment, and this collapse may even terminate in death. Some of the deaths in relapsing fever seem to occur in this critical period, when the fever has completely left, and the patient is, as it were, within a few hours of perfect safety.

How are we to avoid being misled into such gross errors? Chiefly (1) by a careful consideration of the state of the pulse and the general condition of the patient; and (2) by a familiarity with the usual course and the common deviations of the temperature in special diseases. The altered course of the temperature in disease is only one of the manifestations of disturbed action, and, important as it is, the significance of its indications is much affected by a comparison of it with the other well-known signs and symptoms. Moreover, considered as a symptom of any special disease, it has, like the pulse or the state of the tongue, its own natural history in each disorder; and it behoves us to make ourselves as familiar with the course which the temperature follows in the different febrile diseases, as we have been taught to be with the contrast, for example, of the state of the tongue, or the bowels, or the pupils in typhus and enteric fever.

The sudden rise and fall of the temperature in an ague fit,

or its sudden elevation and collapse after a few days in relapsing fever, may bear a superficial resemblance to the alternations in the pyrexia of pyæmia, without possessing anything of the gravity of this fatal disease; the sudden subsidence of the temperature in an ague is followed by a series of similar brief exacerbations in one, two, or three days; in relapsing fever, again, after an interval of a week, the fever may be relit in equal intensity, to terminate and subside as rapidly and as satisfactorily as before. In pyæmia, on the contrary, the oscillations or the sudden subsidence of the temperature afford little ground to hope for the termination of the morbid process in anything less than death. Contrast with these varied oscillations the sudden and definitive crisis in a typical case of pneumonia, where the fever and the disease cease abruptly and permanently, and you will see that the significance of a sudden fall of temperature varies according to the disease in which it is observed, and you may even legitimately connect such peculiarities with the different poisons or agencies on which these different fevers depend.

A fall of temperature immediately after our observations have begun must be interpreted with caution.—This follows from what has just been said. If a great decline should occur the day after admission to hospital, for example, we may not have had time to establish the diagnosis of the disease securely; certainly we cannot have had time to gauge its severity with accuracy. It constantly happens that immediately on admission to hospital the temperature is found to have an unusually high elevation; this seems to be often due to the disturbances connected with moving the patient, and to be thus, so far, accidental. You must, therefore, beware of founding on this high temperature for your diagnosis, and be still more chary of relying on the great decline after admission as any proof of a real amelioration, or of the beneficial action of any remedies which may have been promptly prescribed.

In like manner we must be cautious in estimating the value of a decline in the temperature in the initial stage of a fever. Some diseases are specially characterised by a diminution of the fever in an early stage. In measles, for example, we often find

a very high temperature associated with the other disturbances of the first day of the initial fever, and after a great subsidence of the pyrexia for a day or two the temperature again rises, so as to reach its culminating point on the fourth or fifth day, coincidently with the appearance or the maximum development of the rash. In smallpox also, and especially in the modified form of this disease, the sudden decline of the temperature and of the other symptoms on the third day constitutes one of the features of its history which you must bear in mind.

In this connection, I may also remind you that, even in an *advancing* temperature, the decline from night to morning may be so considerable as to make you suppose that the elevation noted the previous night was transient and insignificant. Remember that the comparison of the temperature is between evening and evening, or morning and morning, and not between the evening exacerbation and the morning remission. This is of special importance in the beginning of typhus and enteric fever. In the latter, indeed, we often have in the initial stage an apparent absence of fever as judged by the pulse and general aspect of the patient, and we can only hope to detect it by means of careful thermometric observations.

Sudden and gradual terminations of pyrexia; Crisis and Lysis.
—Sometimes the termination of a fever, the improvement in the state of the patient, and the decline of the temperature take place so rapidly that the most marked contrast is presented as between a given day and the day following, or even as between intervals of one or two hours. Such a sudden change has always been known in medicine under the name of *crisis*, and this name is retained in the language of thermometry as applied to the sudden diminution of temperature under such circumstances. But a febrile or inflammatory attack may terminate quite satisfactorily in the most gradual manner: the reduction in the violence of the general symptoms, and of the fever temperature, being spread over days, or even weeks. This form of defervescence is known as *lysis*, and is also thermometrically spoken of as such. I have here a chart exhibiting the temperature at the

crisis of relapsing fever, taken every hour, or every two hours, both in the first and the second attack. This case is one selected from the records of Dr Tennent's careful inquiry into the recent epidemic of Relapsing Fever in this city (see *Glasgow Medical Journal*, May, 1871). You will observe that the fall takes place in the most precipitate manner, and that a diminution of several degrees occurs within two or three hours. These observations are the more reliable, as in all doubtfully low temperatures recorded for the axilla, Dr Tennent checked the observation by introducing the thermometer into the rectum also, so as to avoid any fallacy from a mere surface cooling of the body. Contrast with this the chart I now show you of a case recorded by myself in a paper on the temperature in pleurisy. In this case of pleuritic effusion, you will observe that the temperature fell with great steadiness and regularity, but that it took about three weeks to reach the normal limit. It is not often that you will see such a very gradual subsidence of the febrile temperature, but it is quite common to see the decline of temperature extending over three or four days, or even over a week or more. The distinction of crisis, and lysis is often well seen in typical cases of the two forms of pneumonia. The sudden crisis occurs, as a rule, in the form of pneumonia described as lobar (or by the Germans, croupous) pneumonia, while the other form of the disease known as lobular, catarrhal, or broncho-pneumonia, usually terminates in a much more gradual manner.

Sometimes the definitive crisis occurs just about the time we expect it, and the fever terminates at once, and finally. Sometimes the decline proceeds in one or two distinct stages, the one fall supplementing the other, the two stages being separated by a pause, or perhaps even by a slight exacerbation. Occasionally the crisis supervenes immediately upon a great elevation of the fever, never previously reached in the case: and sometimes a *pseudo-crisis*, or even a temporary collapse of the temperature, may have introduced perturbations before the crisis, which will be noticed

more particularly hereafter. The fall of temperature may take place between night and morning, and may seem to be associated with the refreshing influence of sleep; but it is also often seen to occur in the afternoon; and such a diminution is more reliable as a sign of a true remission, inasmuch as it contrasts with the evening exacerbation usually observed in fevers. Even when a decided diminution occurs in the morning temperature as compared with that of the previous evening, we must wait to see if some improvement be maintained in the evening hours before we found much on it for prognosis. Most unequivocal and satisfactory of all, perhaps, is a distinct diminution from morning to evening, confirmed by a fresh reduction in the temperature of the next day. The phenomena of crisis are often associated with sweatings, and sometimes with other discharges supposed to be critical, but these are also often absent. In crisis, the temperature falls rapidly from a high febrile range to the normal limit, or near it, but in not a few cases this limit is transgressed, and a condition more or less of collapse, with temperatures much below the normal, may be often observed, especially in relapsing fever and pneumonia. Dr Tennent gives $92^{\circ} \cdot 8$ F. ($33^{\circ} \cdot 8$ C.) as the lowest point which he observed after a rapid fall of 13° F. ($7^{\circ} \cdot 2$ C.) in a case which recovered; but in a man (æ.t. 50) who died exhausted after the termination of his first attack, the temperature, two hours before death, amounted only to $89^{\circ} \cdot 8$ F. ($32^{\circ} \cdot 1$ C.) in the axilla, and $90^{\circ} \cdot 6$ F. ($32^{\circ} \cdot 6$ C.) in the rectum. The recovery of the temperature from this subnormal condition to its natural level, may take a few days, or only a few hours, for its accomplishment; and it may be varied by a short intercurrent febrile exacerbation; and even sudden elevations to a great height, for a short time, are not unknown in this stage.

In lysis, the decline may be steady from day to day, with only a slight tendency to the usual rise of the evening temperature, the improvement first showing itself by less serious elevations at night. Or, the decline may be equally marked and steady, although the relative nightly rise con-

tinues the same, each day marking an improvement on the previous one. Or, the pyrexia may assume a remitting character, the morning temperatures falling gradually or suddenly, and the evening temperatures preserving for a time their previous elevation. In this way the daily oscillation becomes more striking, till, by a gradual diminution of the daily range, the evening temperatures also come down to the normal level. This remitting character is often seen in the early stage of the convalescence from enteric fever, and constitutes one of the striking features of this disease.

Amphibolic Stage is the name applied by Wunderlich to a period not unfrequently met with in severe, or at least protracted forms of fever, and especially of enteric fever, in which the temperature seems undecided whether to go up or down. A slight diminution on the whole may be clearly perceptible, as compared with the elevation of the previous week; but, instead of any progressive improvement, sudden elevations without apparent cause alternate with appearances of improvement, and ultimately this indecisive improvement may give way to a renewal of the fever at its maximum intensity. Such a period corresponds to the time in which complications, sequelæ, or veritable relapses are apt to originate, and the apparently meaningless exacerbations of the temperature no doubt often concur with complications taking place in such a form as to be beyond the reach of our diagnosis. No very satisfactory directions can be given to enable you to interpret such confusing signs, but it may at least assist you to know that these ambiguous temperatures are sufficiently known and recognised by the best observers as to have given a name to the period in question.

Pseudo-Crisis: Critical perturbation.—In pneumonia, it is not uncommon to find a fall in the temperature (too early, perhaps, for the probability of a final crisis) which, although it does not terminate the fever, and may, indeed, be followed by a renewal of the pyrexia, may still inaugurate a less violent stage of the disease—dividing thus the height of the fever, or the fastigium, as it is called, into two por-

tions. This amelioration, however, is not always observed, and the disease may even go on after it to a fatal termination. Sometimes one day or two days before the definitive crisis, the temperature falls to the normal, or near it, simulating thus a true crisis; but the fever reascends for a couple of days to its former height, or, perhaps, stopping short of the actual maximum previously observed, again gives way to a permanent defervescence. This false crisis may be mistaken for a true one, and the error is the more serious, as it does not follow that, after such a fall, the true crisis must necessarily come. In Ward IX., this session a pseudo-crisis was brought under your notice in the case of a young girl with lobar pneumonia. The respiratory distress was considerable, and Dr Gairdner had ordered a careful trial of tartarated antimony, in quarter or half-grain doses. After two or three doses, sickness and vomiting occurred, and the bowels were loose two or three times during the night, so that the drug was stopped; and at the visit next morning, we found that the temperature had fallen from over 104° F. (40° C.) down to the normal, and the patient herself seemed in a moderately satisfactory state. It was by no means clear, however, either to Dr Gairdner or to myself, that the true crisis had arrived: indeed, it seemed just possible that the disturbance of the stomach and bowels might have reduced, for a time, the previously high temperature, without insuring any real benefit. Accordingly, I asked the sister of the ward to take the temperature again in four hours, and she found that it had risen to $102^{\circ}6$ F. ($39^{\circ}2$ C.) by the afternoon: the fever continued all next day, but fell on the day after that in a satisfactory manner. You had there a good illustration of a pseudo-crisis, and the doubts properly entertained and discussed before you at the bedside indicate the necessity for caution in forming your prognosis. It is in such states of the temperature that the action of various remedies seems occasionally so potent, although altogether powerless to reduce the fever in the earlier parts of its course. Occasionally a final exacerbation (occurring, it may

be, after a slight moderation of the intensity of the fever) immediately precedes the rapid crisis; and just when we may be getting alarmed at the rise of the temperature and the violence of the other symptoms, a sudden fall terminates the fever. This remarkable phenomenon had not escaped the attention of the older physicians long before the use of the clinical thermometer, and it was spoken of by them as a critical perturbation. In connection with such perturbations, you must remember that the existence of collapse temperatures, in the midst of the raging fever, can also be sometimes detected, and in the hourly observations of Dr Tennent in this chart, you see an example of this on the day before the crisis of relapsing fever.

Complications and Relapses.—The progress of defervescence may be proceeding satisfactorily, and quite in accordance with expectation, when the decline of the temperature becomes arrested, or the fever is relit by some complication. Your thermometer may warn you of this before anything else can do so. I remember following the course of a satisfactory crisis in a case of typhus in a young child, when an elevation of temperature one night interrupted the declining series of observations: nothing amiss could be discovered by me to account for the change, and the nurses had seen nothing wrong with the child that day. I supposed the elevation might be due to some trivial disturbance, as the temperature of children and of convalescents is apt to be easily upset, but the elevation persisted, and in the course of a day the early stage of parotitis became quite evident. Such deviations from a normal defervescence should always warn you to examine your patient carefully for any of the usual complications, and even if from their nature they are beyond the reach of definite recognition, the peculiarities of temperature are sometimes of such a character as, under certain circumstances, to make the diagnosis of embolism or of suppuration, for example, extremely probable. But a complication may act in a more occult manner, delaying by its presence the defervescence proper to the primary disease, or modifying, it may be, its

usual character. Bronchitis may thus, for example, delay the crisis of typhus beyond its usual time; or the complications may introduce a remitting character into its crisis or into that of pneumonia. Or, again, the presence of a tubercular taint or tendency in a patient with pneumonia or enteric fever may prevent the temperature from ever becoming normal,—the imperfect resolution of the pyrexia merging into the hectic of phthisis; of this, I fear, we had an example in the young woman with an acute attack of pleuro-pneumonia, the progress of which I frequently brought under your notice. In her case the protracted fever course and the unsatisfactory defervescence, even up to her dismissal, contrasted strongly with the perfect crisis in a typical pneumonia under observation in the same ward at the same time.

Along with complications may be classed relapses and extensions of the original disorder, to which some diseases are especially prone: these sometimes occur just as the first attack appears to be declining, and sometimes even after the whole fever process seems to have come to an end.

The Temperature of Convalescents, however, you must remember is unstable. Before and after the crisis, as already mentioned, remarkable perturbations occur: the fever process upsets the wonderful regulating power which the healthy organism possesses over the temperature, so that during convalescence, slight disturbances which could have no serious influence on the heat of the body in its normal state may produce very considerable changes both of elevation and depression. Thus in the convalescence from enteric fever, errors in diet, the too early or too free use of animal food, the exertion of getting up from bed, or the fatigue of walking, may all produce a marked elevation of the temperature; and while this should not be allowed to alarm us unduly, it may well serve as a warning for the exercise of caution. Constipation, also, may in such cases give rise to a threatening elevation of temperature, and of this we have a good example in the diagram before you—the temperature

which had risen suddenly came down at once in this case after a simple enema.

But it is just on account of the sensitiveness of the temperature in convalescents that the records of the thermometer are so valuable during the recovery from enteric fever: a prolongation of the evening observations into this stage affords us the best evidence of continued safety, or the first alarm of threatened danger.

II.—RARE CASE OF INTERNAL STRANGULATED HERNIA.

By DAVID LECKIE, M.B., C.M., *Staff Surgeon, H.M. British Army, India.*

THE following case may be of interest, both from the extraordinary—probably unique—nature of its cause, and from the comparative absence of symptoms pointing to the extreme severity of the conditions found after death. Indeed, it was not until within two days of the fatal termination that a definite idea of the grave nature of the illness was entertained, though nothing like a diagnosis had been formed:—

The patient was a young soldier, aged 26 years, of 7½ years' service. He reported himself at Hospital about 9 p.m., on September 25th, complaining of what he called colic. He was seen by the apothecary, who prescribed a calomel and opium pill, and an aromatic draught, and applied a sinapism to the abdomen. At my visit next morning, I was told of his complaint of the previous evening, and what had been done for him. He now complained of fever. His skin was hot, tongue moist and coated with a whitish fur, pulse soft, and he said the pain was quite gone. I thought from the symptoms he had simply an attack of slight remittent fever, cases of which are of daily occurrence at this season. I asked him as to the state of his bowels, and he told me they were quite regular, and had been opened the previous day. As usual in such cases I prescribed a purgative, ordering six drachms of castor oil. Next day he seemed in the same state, and as the oil had not operated, sulphate of magnesia was given, and diaphoretic mixture.

On the 28th of September, he complained of slight pain in the belly, referring it to the right iliac region. The belly was soft, and nothing could be felt on palpation. Percussion showed slight dulness over the caput cæcum coli. The diaphoretic mixture was ordered to be continued, and the belly to be fomented.

On the morning of the 29th September his appearance and general condition were seemingly unchanged. He had been vomiting occasionally during the night. The vomited matter was the greenish bile, which is almost invariably thrown off in large quantities in remittent fever. In the evening he said he had no pain, and seemed very well. The vomiting still continued of the same character. It had no stercoraceous smell, and did not attract much attention. The bowels had not yet been moved, and a drop of croton oil was ordered to be given in a colocynth pill.

Next morning (30th September), he said he thought the pill had brought back the pain a little. His condition was apparently unchanged, and there was nothing in his expression, or the character of the pulse, to attract special notice. There was slight tympanites, but the belly was soft. An enema of castor oil and turpentine was ordered, and the fomentations were directed to be continued. The pain continued next day; but he did not complain much of it. The vomiting still persisted, unchanged in character. He had several aromatic and sedative draughts to try and control it; but they had no effect. In the evening he said he thought he felt that his bowels would soon act, and unless questioned scarcely referred to the pain. I was still misled by his appearance and condition into the supposition that it was merely obstinate constipation, and by the remembrance of a case which, a few weeks previously, had defied for days all efforts at purgation by medicines, both by mouth and rectum. I ordered that a turpentine enema should be given if no action of the bowels took place soon, and if that failed, a drop of croton oil in an aloes pill. These measures had no effect. Next day there was no apparent change. The man seemed much in the same condition as on admission. The

vomiting was unchanged in character. The pulse was still soft as it had been all along; but was a little weaker. I still hoped that the constipation might account for the continued feverishness and the obstinate vomiting; but I feared it was something more serious, and determined not to give any more purgatives by the mouth. I directed the apothecary to pass a long tube, and give an enema carefully and slowly, morning and evening. Next morning (October 3rd), I was told that there was difficulty in passing the tube properly, and that the injections had come away without any effect, and that the patient had been somewhat delirious for a short time the previous evening, and had a slight "weak turn" with cold sweats; but that after a little brandy he got all right again. I noticed no change; but on percussing the abdomen there was dulness in both flanks, and on palpation fluid was felt rushing backwards and forwards with a metallic sound, as of fluid in an air cavity. The belly was soft, and the tympanites had not increased. The pulse was soft, but weaker and more hurried; the vomiting as before. The man was quite calm and rational. I could not, at the moment, bring myself to realize the meaning of this sudden accumulation of fluid. The patient's appearance, and the absence of any increase of the previous symptoms, still deceived me, and the apothecary, an experienced man, and who was constantly seeing him, did not seem to think very seriously of him. I told him to try again, and pass the long tube, and to apply stupes to the abdomen, and give a little brandy occasionally, as he should think needful. During the evening, the patient became rather delirious, but was quiet, and answered questions rationally. The pulse was still weaker and more hurried; but unchanged in character. I directed simply to give stimulants, and apply stupes. I had no longer the least hope for the man, and thought the bowel must have ruptured. He died on the morning of the 4th October, between 5 and 6 o'clock. There was no anxiety of expression, nor any hard wiry character of the pulse, nor anything to point to rupture of the intestine, but the fact

that fluid was suddenly accumulated in the abdominal cavity, and that there had been slight temporary delirium and shock the evening previous; but to the apothecary, who was present, this indicated nothing serious.

Post-mortem Examination.—On opening the abdomen, a large quantity of faecal matter escaped. The small intestines, extremely distended with air, looked like a dilated colon. Inspecting the bowels before removal, the colon was not seen in its usual place; but the caput caecum was seen, greatly dilated and intensely inflamed, lying in its usual situation, but reversed, with the vermiform appendix upwards and outwards. In the caecum were two openings, each about half an inch long, from which the faecal matter had escaped. This extremely dilated caecal portion was traced down to the pelvic cavity, which it completely filled, being adherent to the abdominal wall as it entered the cavity. These adhesions were separated, and the portion of bowel which was in the pelvis was drawn out. This was a loop of the ascending colon, in a state of intense inflammation and congestion; its contiguous surfaces being adherent and forming a regular hernia. It was greatly distended with faecal matter, and had become strangulated by the brim of the pelvis. The whole of the remaining portion of the large intestine, below the hernia, was contracted to a size little larger than the oesophagus, and its walls were much thickened. Emerging from the pelvis, the part which corresponded to the transverse colon, lying loosely in the abdomen, stretched obliquely up to the position of the splenic flexure, there joining the descending portion, which was thus in its normal position, but had not been noticed on first inspecting the abdomen, on account of its contracted state. All the other organs were healthy. The bladder was a little contracted. The only clue to the origin of this condition of the colon was a strain which the man received at the camp of exercise last year, but which does not seem to have inconvenienced him at all. For a time, probably, the bowels acted quite naturally; and had attention been paid to them, the man might have lived a

long time without suspecting anything wrong. But soldiers are extremely negligent in this way, and there can be no doubt that this neglect was the ultimate cause of the strangulation of the hernial loop. Faeces would always tend to lodge in such part of the bowel, carrying it more and more into the pelvic cavity, forming a dependent pouch, and the further down it was thus carried the greater would be the tendency to constipation. Purgatives would, for a time, seemingly produce a satisfactory evacuation, but there would always remain some collection in the pouch. The contraction of the lower part of the gut would be the consequence of the increasing constipation. The man never applied at hospital for relief from this condition; but soldiers are extremely averse to coming to hospital, if they can possibly avoid it, and often purchase purgatives for themselves. This man must have suffered from chronic constipation for a considerable time, though he said, on admission, that his bowels were regular, and had been opened the day before. This I do not believe. I afterwards learned he had been attempting a somersault a few days previously, after which he felt the pain which brought him to hospital, probably afraid he must have done himself some injury in his constipated condition, though still concealing it. It is difficult to explain the absence of acute symptoms in a case of the above severity, unless it be that there is a kind of constitutional apathy induced by residence in this climate, which is proof against excitation even so severe. Their absence led to quite a misapprehension of the case, which was scarcely modified till shortly before death.

III.—A STUDY OF 200 CASES OF RE-VACCINATION.

By JOHN AIKMAN, M.D., *Guernsey; formerly Assistant Medical Officer, Hampstead Smallpox Hospital, London.*

DURING the year 1874, smallpox was epidemic in Jersey. In the second week of January, 1875, the first case was imported into Guernsey; and the public, terrified by vague reports of the mortality in the sister island, sought vacci-

nation in large numbers. I had thus an opportunity of observing a considerable number of cases, and, having carefully noted my observations, think that such lessons as I have been able to draw, may prove not uninteresting to the medical public.

With regard to the primary question, "Is re-vaccination an absolute preventive of smallpox?" we have little to do. Dr Russell tells us that "it is as well proved as anything out of the exact sciences can be," and what is so thoroughly proved simply amounts to this, that in the London and Glasgow epidemics of 1871, no case of smallpox is known to have occurred in a person successfully re-vaccinated with primary lymph. This same epidemic of 1871, which so fully confirmed us in our belief in re-vaccination, also taught some very valuable lessons concerning primary vaccination; which, I think, have been too little made public. One of these was, that primary vaccination, though most effective in its *modifying* effect upon the disease, was not to so great an extent *preventive*, as had been formerly believed. My own experience of that epidemic in the Hampstead Smallpox Hospital, London, gives the following results:—

1st. As regards modifying influence.

In my children's ward (where the influence of primary vaccination was best observed), I find that 270 cases were admitted, between May 2nd and July 3rd, 1871, all vaccinated. Among this number, ten deaths occurred, or a mortality of 3·7 per cent. The details of these deaths are as follows:—

With one vaccine mark—1 at 8 years, 2 at 9 years, (both the latter hæmorrhagic cases, and one having very profuse vesical hæmorrhage), 1 at 10 years, and 1 at 12 years.

With two vaccine marks—2 at 5 years, 1 at 10 years.

With four vaccine marks—1 at 9 years, hæmorrhagic.

With eight vaccine marks—1 at 8 years, a death from complications during convalescence.

If, against this very moderate mortality, we set the result in the case of 231 unvaccinated children admitted at the same time to the same ward, we find that 112 deaths occurred, or the enormous mortality of 48·5 per cent. From this

number we might almost be justified in excluding 4 children, who were asserted to have been vaccinated, and 17 in whom the vaccine marks were quite recent at the date of seizure.

In the face of such statistics, it is surely impossible to doubt that primary vaccination *modifies* smallpox. But when we come to consider how far it *prevents it*, we face a different assortment of facts.

2nd. Does primary vaccination prevent smallpox?

I think it best to answer this question by detailing the 270 cases referred to above. The details are as follows:—

With 8 good vaccine marks—1 at 8, 1 at 9 years; total, 2.

With 7 good vaccine marks—1 at 8, 1 at 11, 1 at 12 years; total, 3.

With 6 good vaccine marks—1 at 3, 2 at 5, 1 at 7, 2 at 8, 1 at 9, 2 at 10, 2 at 12, 1 at 15 years; total, 12.

With 5 good vaccine marks—3 at 5, 1 at 6, 2 at 7, 1 at 8, 2 at 9, 1 at 11, 3 at 12, 1 at 14 years; total, 14.

With 4 good vaccine marks—1 at 2, 2 at 3, 1 at 4, 1 at 5, 6 at 6, 2 at 7, 5 at 8, 7 at 9, 7 at 10, 6 at 11, 7 at 12, 4 at 13, 2 at 14 years; total, 51.

With 3 good vaccine marks—3 at 5, 7 at 7, 9 at 8, 11 at 9, 9 at 10, 7 at 11, 5 at 12, 13 at 13 years; total, 64.

With 2 good vaccine marks—1 at 2, 1 at 3, 3 at 4, 5 at 5, 4 at 6, 9 at 7, 7 at 8, 5 at 9, 14 at 10, 11 at 11, 7 at 12, 12 at 13, 1 at 14 years; total, 80.

With 1 good vaccine mark—1 at 14 months, 2 at 3, 6 at 4, 1 at 5, 2 at 6, 4 at 7, 4 at 8, 6 at 9, 7 at 10, 5 at 11, 3 at 12, 3 at 13 years; total, 44. Grand total, 270.

If these statistics prove anything, they prove that a well vaccinated child may have smallpox at a very early age. We cannot deduce because we have fewer admissions with six marks than with four marks, therefore, a child with six marks is better protected, or we must also deduce that a child with one mark is better protected than one with three marks; and, also, by referring to the former figures, that vaccinated are more liable to smallpox than unvaccinated children. The real explanation of the large

number of admissions with two and three marks seems rather to be, that those are the numbers in most frequent use. One deduction, however, may fairly be made. It will be observed that above six years of age the number of admissions, irrespective of the number of marks, rapidly increases. This would seem to point to the conclusion that the physiological changes attending the second dentition have some effect in destroying the preventive effect of previous vaccination. Possibly we might suspect, from the figures given above, that those with the smaller number of marks are liable to the disease at an earlier period of life than those with the larger ones—thus, in the cases with one mark, we have 6 at 4 years—a much greater proportion than any of the others shew.

Dr Seaton in his article on vaccination, and Mr Marson in his article on smallpox, advise re-vaccination at the age of puberty; but both these articles were written before the epidemic of 1871, and I imagine in the face of such statistics as these, such an opinion requires revision. It is at least worthy of remark that only two of the deaths among the vaccinated occurred below the age of six years.

With this preliminary matter, of which more hereafter, I proceed to the examination of my recent re-vaccinations. In so doing, I have arranged my observations as follows:—1st, the proportion of cases considered vaccinated, in which re-vaccination may be successfully performed; 2d, the relations of re-vaccination to the number, or size, of the primary vaccination marks; 3rd, the effect upon present vaccine operations of previous re-vaccinations; 4th, the method of re-vaccinating; 5th, any observed circumstances which appear to have been favourable to the activity of the infection, or to have determined the course of the vaccine disease; 6th, the question—"Who should be re-vaccinated?"

I. *The proportion of cases considered vaccinated, in which re-vaccination may be successfully performed.*

This, in the present instance, is simply a question of figures; but, in stating these figures, it must not be for-

gotten that not all the 200 cases fall fairly into this category. I have, therefore, prepared a list of the cases excluded, which I have made sufficiently full that anyone who takes exception to my reasons for exclusion may alter the results to his own satisfaction. The first class excluded are such failures as have been previously re-vaccinated. To this I think no exception can be taken. The second class excluded are those failures in whom re-vaccination had been, more or less recently, tried by other practitioners. This is more debateable ground. In defence of my exclusion I urge the opinion of Dr Seaton, that an attempt at vaccination, even if it produce no local evidence of success, may render the system insusceptible to vaccine for a certain time afterwards. I have also myself noticed a decided modification produced in the course of subsequent smallpox by an unsuccessful attempt at re-vaccination.

Lastly, I have excluded the case of a hospital nurse whose primary vaccination had been performed only three years previously.

Total number attempted,	-	-	-	200
-------------------------	---	---	---	-----

Number Successful.

At first insertion,	-	-	158
At second insertion,	-	-	17 = 175

Failures.

A. Previously re-vaccinated,	-	7
B. Re-vaccination previously attempted,	-	7
C. Recent primary vaccination,	-	1 = 15
Unaccountable failures,	-	10
		— 200

Details of Failures.

Class A. Re-vaccinated.

1. Two infantile marks. One re-vaccination 1868. An accidental re-vaccination 1872.

2, 3. Infantile vaccination asserted. Re-vaccinated about 20 years ago, during adult life.

4. Three infantile marks. Re-vaccinated 1870.

5. Three infantile marks. Re-vaccinated 1868.

6. Infantile vaccination asserted. Re-vaccination frequently tried; was once successful more than 20 years ago, during adult life.

7. Two infantile marks. Re-vaccinated 1868.

Class B. Previous re-vaccination having failed.

1. No infantile marks, but has been repeatedly tried.

2. Four infantile marks. Re-vaccination failed 1868.

3. One large infantile mark. Re-vaccination often failed; last time 1870.

4. One infantile mark. Re-vaccination failed 1868.

5. Three infantile marks. Re-vaccination tried 1870, gave rise to a little pain in axilla, but no local disease.

6, 7. Each, two infantile marks. Re-vaccination tried a week previously in Jersey.

Class C. Recent primary vaccination.

1. Hospital nurse for smallpox ward. Primary vaccination 1872.

It would thus appear that a very large proportion of a community "considered vaccinated" are liable to further vaccine disease. *This does not prove that the same proportion are liable to smallpox, but it does prove that THEY ARE LIABLE TO A FURTHER PROTECTIVE MEASURE.*

In some cases detailed above, the re-vaccination seemed to me from the first unnecessary; but when it was desired by a patient, after my having stated my belief in its inutility, I did not feel justified in refusing the opportunity for experiment.

I subjoin a list of the previous vaccination marks in the foregoing cases, principally because it gives an idea of the state of vaccination in the community, though the record was made with a different object. I would ask the reader to compare this Table with the one placed alongside, and he will see my grounds for saying that the statistics of smallpox admissions, previously offered, bear a relation rather

to the state of vaccination in the community, than to the greater protective power of a large number of marks.

Statement of the number of Infantile Marks found upon 200 persons re-vaccinated in Guernsey, January, 1875:—

			From List of Failures.		
With	5	Marks, 3	0	3	
"	4	"	19	1	20
"	3	"	79	3	82
"	2	"	49	4	53
"	1	"	24	1	25
"	1*	"	5	2	7
One large, on Nævus,			1	0	1
Asserted,			3	4	7
Unknown,			2	0	2
			<hr/> 185	<hr/> 15	<hr/> 200

Statement of the Admissions to the Children's wards, Hampstead Smallpox Hospital, London, between May 2 and July 3, 1871, classified according to the number of Vaccination Marks.

With 8 Marks,	2
" 7 "	3
" 6 "	12
" 5 "	14
" 4 "	51
" 3 "	64
" 2 "	80
" 1 "	44
	<hr/>
	270

II. *The relations of re-vaccination to the number, or size, of the primary vaccination marks.*

Number and size are directly interchangeable, but the former is often a convenient way of expressing the superficial area of the mark. (See Dr Russell's paper, *Glasgow Medical Journal*, Nov. 1872.) When a single large mark existed, I have indicated it in my notes so, I. (in cases where its area was equal to 4 puncture marks), and so, 1, when less than that size. Stated abstractly, the relations of primary and secondary diseases are in direct proportion to the number and size of the marks and the age of the patient. Thus, with only one exception, children 8 years of age, with 4 good vaccination marks, took the secondary disease slightly. By this I mean, that induration the size of half a crown piece occurred, but with little pain, and that the disease subsided, and the crusts fell off, while others of greater age, or less well protected (vaccinated at the same time), had scarcely passed the acmé of the disease. Interesting, in connection with these cases, are the cases of two infants, one of whom was first vaccinated on April 4th, 1873, and the other in July 1874. Upon these occasions, only one insertion was

* This sign is used to indicate a single large mark, equalling in size the ordinary four.

successful, and both of them I re-vaccinated on January 15th, 1875. Both of these children took the disease exactly as children of 8 years of age did, who had four vaccination marks. In both cases the primary mark was as large as a fourpenny piece. Another observation, regarding primary vaccination, bears upon this point. In a few instances only one or two of the original insertions have been successful, and in such cases I have, on the 8th day after primary vaccination, made re-insertions to complete the number. In all cases, and on whichever arm the re-insertions were made, they have been successful; but they have always gone rapidly through the stages, and reached that of dry crust by the 8th day. This is one of the various observations which have led me to the conclusion that a rapid succession of stages is the surest sign of the potency of previous infection.* In direct proportion to the increase of age did the modifying effect of previous vaccination decrease, until after puberty, at which time vesicles, more or less perfect, became the rule. These were formed about the 6th day, but the important point seemed to be that their greater or lesser perfection was irrespective of the number of infantile marks. Only one exception to the rule was noted, and it is this, that 3 *deep scars* were as good as four ordinary marks, and their effect lasted longer. In connection with this topic it is well to pass in review the manner in which secondary vaccination is modified.

It is so in three respects.

1st. In the imperfection of the vesicle.

2nd. In the increased areola, and affection of the lymphatic glands.

3rd. In the more rapid progress of the different stages.

1st. The imperfection of the vesicle is very frequent, and is found in all degrees. In some cases a clear vesicle was

* Since the above was written, I have been successful in obtaining infection with lymph taken from the child's own arm. This being the case, I propose in future to ask the parents of children whom I have vaccinated to inform me, by the 6th day, whether all the spots have taken, and if not I purpose making fresh insertions upon the 6th day with lymph from the child's own arm. By this means, the insertions made will be earlier, and the lymph used more active.

formed, full, and with rounded edges. In others a flat milky looking vesicle, and in others again a thin line of raised cuticle along the margin of the scratches, and surrounded from the first, or even preceded by, acute angry inflammation. The greater or less perfection of the vesicle seems to be in some respect an evidence of satisfactory infection.

2nd. Next in order comes the surrounding inflammation and affection of the lymphatic glands. This was almost universal. The inflammation was acute, and the swelling sometimes excessive, but in no case did serious consequences ensue. The gland affection was sometimes observed in cases where no local effect was produced, and when such was the case I did not repeat the insertion.

3rd, And most important of all, is the rapid progress of the stages. Invariably it was most marked in well-protected children, and I think is the most perfect evidence of the non-liability to vaccine infection. An ill-protected child may pass more slowly through the various stages, but a well-protected child is sure to pass rapidly through them. I have seen no exception to this rule. The same holds true of all who have been successfully infected after re-vaccination. It must here be remarked that by rapid progress I do not mean rapid infection; but rather, that *after the first sign of infection, the disease was precipitated through its remaining stages with remarkable rapidity.* Thus a lady (a tertiary vaccination), who showed no sign until the morning of the 5th day, had a complete vesicle on the 6th, and crusts well-dried on the 8th. It is also to be said that the crusts are much less adherent in secondary than in primary vaccination; and, so far as my previous experience goes, the resulting cicatrices are less permanent. Partly no doubt upon this account, and partly from the greater activity of the ages at which re-vaccination is performed, secondary crusts are more common.

The conclusion to which I have been led is, that in proportion to the age of the patient, up to a certain point, and the greater perfection of the infantile marks, the vesicle

is less perfect, and the progress of the various stages of the disease more rapid.

III. *The effect upon present vaccine operations of previous re-vaccinations.*

The observations upon this head point rather clearly to the conclusion, that previous re-vaccination affects present operations principally in proportion to the age at which such previous re-vaccination had been performed. Thus, in only one instance did a re-vaccination below puberty prevent re-infection after an interval of seven years; while in one instance did a re-vaccination above puberty prevent re-infection after seven years: and in three instances after twenty years. The evident conclusion is, that re-vaccination is necessary more frequently during, than after the cessation of growth. So true is this, that, in the case of two growing boys, the insertions took slight hold after an interval of merely four years.

In only one instance (re-vaccinated 1859) in which re-vaccination had been performed during adult life, did the disease take violent hold. In all other instances the effect was very moderate, and the stages were passed through very rapidly.

The result of such observations as I have been able to make, lead me to believe that tertiary vaccination, whether absolutely necessary or not, is at least a very trifling inconvenience.

I subjoin notes of the successful cases, the unsuccessful having been already detailed.

Cases of Successful Tertiary Vaccination.

1. Innoculated in youth. Vaccinated 1859.
- 2, 3. Re-vaccinated 25 years since, in adult life.
4. Re-vaccinated 1859, in adult life.
- 5, 6. Re-vaccinated in youth, 47 years ago. Disease only took slight hold.
- 7, 8, 9. Re-vaccinated 1859, at that time all below ten years of age. All successful after a second insertion.

10. Re-vaccinated 1868, at nine years of age.

11, 12. Re-vaccinated 1868, below puberty.

IV. *The method of re-vaccinating.*

In all cases I vaccinated by scarification, either with a needle-pointed rake or a lancet. Dr Seaton rather hints, in his article on vaccination, that the deeper insertion by puncture gives a deeper scar, and if such be the case, my own experience would go to shew that a good *deep* scar is a matter of some importance. But I have invariably seen good deep scars from the method I use, and I rather think that in re-vaccination there is perhaps not the same reason for a deep insertion. It appears to me that in re-vaccination our main aim should be, to insure the disease taking, and such being the case, scarification is much the preferable method. I had good opportunity to confirm this opinion in my recent cases, inasmuch as my partner, Dr Francis Carey, using the same lymph, failed in almost every instance, while I succeeded in most, and he, by a subsequent scarification, succeeded in almost all the cases where he had failed by puncture.

The method is very simple, and perhaps only in its minute details differs from that in common use. Scratch a rectilinear figure, a square, a triangle, a diamond, any figure, indeed, which will plainly indicate the direction of the scratches. Then lay in the lymph, put the skin upon the stretch, and with the spatula of the rake, or edge of the lancet, work *transversely* to the direction of the scratches, until the small clot is attaining some little consistence. Then with the flat of the blade smooth the clot over the scratches. All this means, be it observed, continuing working at the arm until it is nearly dry.

The advantages of the method are, that it is perfectly painless and eminently successful. This latter is a matter of some importance in re-vaccination, as failures there are much more common than in primary cases.

V. *Any observed circumstances which appear to have been favourable to the activity of the infection, or to have determined the course of the vaccine disease.*

One of the most prominent of these was faintness. In every instance in which faintness occurred after the insertion of the lymph, the disease took rapid and violent hold. In two cases the faintness was accompanied by epileptiform twitchings. Possibly this fainting is due to the rapid absorption of the lymph, but more probably the reverse is the case; the faintness is due to fear, and the rapid absorption to the faintness. We know that faintness promotes the absorption of poisons, and in one instance I had the opportunity of observing the fact with regard to lymph. I punctured a primary vesicle on the eighth day, and the lymph beaded well, but the child suddenly became sick and faint, and the whole lymph disappeared, nor did it reappear during the ten minutes longer that the child was under observation. In cases certified insusceptible to vaccine disease, this proceeding might be imitated. .

In stout subjects the areolar inflammation was greater than in spare, and in the middle ages greater than in the old or young. The oldest re-vaccination was 81 years, the youngest 1 year. Intercurrent disease seems unfavourable to infection, as I have previously observed in primary cases. A word here upon the treatment of re-vaccination. The great danger is from surrounding inflammation, and the best prophylaxis is the injunction of rest from the stage of vesicle until the ninth day. Experience teaches that it is very necessary to specify what may *not* be done. After the ninth day, and if the vesicle be still flat, a bread and milk poultice is sometimes comforting, but before this date it is apt to increase the amount of skin affected. It should never be applied for more than 12 hours, or suppuration and ulceration may occur.

Sometimes the vesicle bursts, and the sero-purulent discharge attacks the surrounding skin. This should be guarded by the application of some simple ointment, such as spermaceti. If secondary crusts form, they should be softened with oil, but on no account picked off.

VI. *The question—"Who should be re-vaccinated?"*

This question is, of course, to be considered (at least in

an insular position) only in the presence of a smallpox epidemic. In answering it, we must be careful to remember that our aim is to prevent any centre of infection, rather than to guard the individual from danger from smallpox. With such an object in view, and regarded in the light of previous statistics, I should say that you may spare children until eight years of age who have four vaccine marks (or three unusually deep ones), *provided you re-vaccinate every member of the household above that age, not previously re-vaccinated.*

The question of tertiary vaccination is more difficult. That re-vaccination is ever possible, proves one of two things; either that the vaccine pabulum (accepting the ordinary theory of zymotic disease) is not destroyed, and reproduces itself, or that the materials from which the tissues are formed in the process of growth contain such a pabulum. If this latter be, and I think it is, the more reasonable supposition, then re-vaccination should be less often necessary after the completion of growth than during that process. Such is really the case, if we are to accept the susceptibility to vaccine disease as evidence. Comparing the growth of the body during the first eight years, with that of the second eight, we should find that a nearly similar proportion existed, and that each epoch contained an important physiological period, namely, dentition and puberty. It would seem, then, advisable to repeat the operation at the end of sixteen years. Another eight years would bring us to the termination of growth, and a successful vaccination at that period would stand good for twenty years, even after which lapse, re-infection would be difficult. If successful, it would certainly be sufficient for the remainder of life.

There is one further question which merits consideration. If we fail to infect, what then? Setting aside the evidence of common sense, I have positive fact to support me in saying, that we cannot assure a patient's immunity to smallpox. But I have also observed a certain proportion of cases of smallpox occurring in persons after the failure of

re-vaccination, in which the entire rash aborted, scarcely becoming vesicular. Consider this in the light of M. Trousseau's experiment, by which he proves that the local affection vaccinia is not necessary in order that vaccination should modify the disease, and we may, I think, fairly assure our patients that failure after two insertions, *though not a preventive*, will probably so modify the disease as to render it a slight inconvenience and no more.

These observations are made in, and recommendations refer to, the presence of a smallpox epidemic; at the commencement of which it is a great thing to have perfectly protected nearly 500 souls out of a population of 28,000, of whom most of the children may be said to be already protected. Only by such measures will Sir James Simpson's scheme to stamp out smallpox ever be effected, and that never until the need of systematic re-vaccination shall have become impressed upon the minds, not only of the lawgivers, but of the public of Great Britain. Meanwhile, surely it behoves the medical profession to teach, in precept and practice, the only principles which can ever free us from one of the most loathsome as well as most fatal of diseases.

IV.—WOUND OF LEFT SUBCLAVIAN ARTERY AND VEIN; PERFORATION OF PLEURA; DEATH OF PATIENT FROM HÆMORRHAGE NEARLY THREE WEEKS AFTER INJURY.

By J. C. OGILVIE WILL, M.D., *Assistant Surgeon, Aberdeen Royal Infirmary.*

THOUGH the details of the following case are somewhat imperfect, the only materials I have by me, with which to refresh my memory, being the reports furnished to the Procurator Fiscal by Professor Pirrie and myself—other notes which I possessed having been unfortunately lost—still, I think, it presents features of sufficient interest to warrant its publication.

On the evening of Sunday, May 22, 1870, my attendance was requested on W. W., a mariner who had, I was informed, been stabbed by a woman in South Shields two

weeks before, and who was suffering from profuse hæmorrhage. On my arrival at the house, a relative of the patient furnished me with the following particulars as to the cause of his illness and subsequent treatment:—On the 7th of May, about four o'clock a.m., he was struck in the neck with a clasped knife; considerable bleeding ensued. He was then taken to the Newcastle Infirmary, and remained under treatment in that institution until the 19th, when he left. Next day he left Newcastle by steamer for Aberdeen. While on his passage bleeding recommenced, but was controlled by means of dressings applied by the captain of the ship, and as a further precaution the captain called at Holy Island, where a medical man saw W. W., and gave directions as to what treatment should be adopted should bleeding again take place. No further hæmorrhage occurred till the night when I was called to him. Professor Pirrie had also been sent for, and arrived soon after I did. On examination we found that he had lost a large quantity of blood, the bed-clothes being saturated with it, but the hæmorrhage had then quite ceased—wet clothes and pressure having been the means employed. His body was cold and blanched; face pale and anxious; pulse weak and feeble; pupils slightly dilated; lips bloodless; tongue raw; respiratory movement of chest on left side much impaired. The patient complained of great pain in his left shoulder and elbow, and of sickness and faintness.

On examining the part where he had been wounded we observed a large pulsating tumour or swelling, measuring about four inches by five, situated behind and below the outer half of left clavicle, its summit being immediately behind the clavicle, its base extending in the direction of the axilla. On the upper part of this swelling there was an opening about the size of a fourpenny piece, through which a firm coagulum protruded. This tumour, which evidently consisted of clotted blood, to which pulsation was transmitted from the subclavian artery, had caused displacement of the clavicle upwards and forwards into the neck. There was also a swelling over the clavicle and extending up the

neck due to infiltration of the tissues which, together with the displacement of the collar bone, prevented compression of the subclavian artery, and the slightest effort on our part to depress the shoulder or render the neck straight, caused such pain that the attempt had to be at once abandoned. A compress of lint saturated with a solution of perchloride of iron in glycerine was applied, and retained by a bandage, and over this a bladder containing ice; opium, brandy, and milk were prescribed; absolute rest and constant watching were enjoined; and should the least bleeding occur we were at once to be sent for.

When I visited the man next morning, and again in the afternoon, his condition was much as it had been on the night before, so the dressings were not disturbed, and the treatment was continued. In the evening, slight bleeding commenced, but was speedily checked by the perchloride of iron and pressure. Dr Pirrie and I then decided, on account of the gravity of the symptoms, to request Doctors Fiddes and James Will to meet us in consultation, which they did, and after careful examination and consideration of the case, we came to the unanimous conclusion that the same treatment should be continued, but that, should further hamorrhage take place, an attempt must be made to secure the vessel. During the 24th and 25th, the man seemed to be improving, but complained much of pain, and was very restless, and on the evening of the latter date, there was a slight ooze of blood from the edges of the wound, but not sufficient to remove the clot which was protruding from the opening. On the following morning, at 5.30, we were sent for, as bleeding had again set in. On our arrival we found that a great loss of blood had taken place, the clot of blood before-mentioned had been loosened, but not altogether ejected, and the flow of blood had been restrained to a considerable extent by the same measures as had proved effectual on the former occasions. On raising the edge of the pad, which had been applied and held in apposition, blood was seen welling up. It was then at once determined to cut down on the subclavian artery, and the patient having

been informed of how slight a chance of life any operative procedure afforded—but that it was the *only* one—he without hesitation agreed to the proposal. The operation was then commenced, but almost immediately after the first incision the man expired. At 7.30 on the following morning, a *sectio cadaveris* was performed, when the following appearances were observed:—Body well nourished, but pale and bloodless. The wound was situated behind the clavicle, $3\frac{1}{2}$ inches from its inner end, and passed downwards and inwards for a distance of about four inches, and terminated in the cavity of the pleura, which was perforated, the opening in that membrane measuring half an inch. A minute slit on the outer side of the left subclavian artery, near its origin, was detected, and this we considered sufficiently conclusive; but while attentively examining it, Dr Pirrie called our attention to the subclavian vein, which had also been punctured along its outer side. The description I have given of the local *post-mortem* appearance is meagre in the extreme, but the soft parts were so matted together by infiltration and pressure that the identification of the different tissues, beyond what I have mentioned, was rendered impossible.

A large quantity of clotted blood, pus, and serum was found within the pleura; the upper part of the left lung was much infiltrated with blood, the lower two-thirds, and the whole of the right lung pale and bloodless. The heart pale and flabby, and the blood contained in it was scarcely sufficient in amount to stain a white cloth which was applied to it.

The subclavian arteries, except in the case of gun-shot wounds, are seldom injured; this immunity they doubtless owe to their protected situation. Wounds of both artery and vein by cutting instruments are still rarer. The only case with which I am acquainted is that of Pierre Cadrioux, related by Larrey—whose life, as suggested by Mr Moore in Holme's System of Surgery, “appears to have been saved by the singular circumstance that the vein was also pierced by the lance which wounded the artery. The blood from the

latter vessel, when restrained from passing through the external wound, escaped into the vein, and was thus saved to the system until the wound healed."

In the case I have narrated, it appeared to us utterly impossible to determine in what part of its course the vessel had been wounded, on account of the displacement of the parts; and as so long a period had elapsed between the primary and secondary hæmorrhages, we were not altogether without hope that the means which had before proved effectual might do so again, and with the aid of perfect repose, which had before been denied, with more lasting effect. We were, therefore, unwilling to risk any operative procedure unless further hæmorrhage should demand it, and though Dr Pirrie observed that the blood seemed of a darker hue than that of pure arterial, it did not occur to us that the vein had also been wounded: had it done so, it would have still further convinced us of the futility of attempting to save the man's life by operation.

The possibility of recovery without deligation of the wounded subclavian artery is well illustrated by a case related in the Medical and Surgical History of the American War, concerning which Surgeon D. C. O'Keefe remarks, that there "was undoubted severing of the left subclavian artery, as indicated by the absence of pulsation in the radial and brachial arteries," and in which the lung was unquestionably wounded. After the cessation of alarming hæmorrhage and hæmoptysis, which were only present on the day the man was wounded, and which had entirely ceased before his admission to Hospital on the following day, the man recovered without a single bad symptom presenting itself.

The most striking point connected with the case of W. W. seems to me that he should have lived so long as he did, especially when we take into account the amount of exertion he must have undergone in his movements from place to place.

In further illustration of the length of time that may elapse between the reception of injury and a fatal issue, I may cite the following cases observed during the

American War:—Private John J. T. was admitted to Hospital on Sept. 20th, 1864, with a gun-shot wound of the right side of the neck received the previous day. He was very weak from hæmorrhage from the wound, and hæmoptysis. The wound was plugged, and water dressings applied, the hæmorrhage and hæmoptysis continued, and he died on Oct. 6th. On *post-mortem* examination it was found that the subclavian artery had been wounded in the second part of its course by the sharp-pointed extremity of the first rib which had been fractured, and the lung torn by part of the same bone having been sent into it. This patient survived the lesion of the artery sixteen days.

In another case, the subclavian artery was lacerated by the passage of a ball as it crossed the first rib, and quite a number of spiculæ of bone were driven into it, plugging it up entirely for two inches. This man was wounded on August 20th, and did well till Sept. 7th, when profuse hæmorrhage—which was restrained by pressure—took place. Ligature of the vessel was then attempted, but after incision, owing to the state of parts, the artery could not be found, and he died on Sept. 9th—the 21st day after injury.

In the two last cases the temporary arrest of hæmorrhage is accounted for, in the one by the projection of the piece of rib into the artery round which fibrine probably collected, and offered a barrier to the egress of blood; in the other by the plugging of the vessel by the particles of bone. In the case I have narrated, the pressure exerted by a coagulum of blood seems the only possible explanation of the same circumstance.

V.—SOME REMARKS ON INSANITY.

By STRUTHILL H. WRIGHT, M.D., M.R.C.P.E., *Physician to Barnhill Hospital and Asylum, Glasgow.*

THE STORY OF AN "INSANE" LIFE.

AT a circuit court, held in Glasgow, October 1874, Archibald Miller, who, on the 15th May, had murdered his wife, was sentenced to death as the just recompense of the measure of guilt involved in the commission of such a crime

by him. The execution of the sentence was postponed "during Her Majesty's pleasure." Representation was made to the Home Secretary in a memorial signed by many members of the Glasgow community, and also of the medical profession in Glasgow, that "extenuating" circumstance existed which made hanging in this case not a just, but an unjust recompense for the measure of guilt involved in *this man's* commission of the crime of murder.

It seems well, for certain reasons, the validity of which it is hoped the reader of the following will, on perusal, admit, that the story of this life (as an episode in which the act of murder occurred) should be put on record.

The agents for the defence, Messrs Balfour & Paterson of Glasgow, have very courteously placed at disposal, for the purpose of the present paper, the precognitions of witnesses cited at Miller's trial. In the following, we shall therefore summon again these witnesses to present the evidence given on the occasion of that trial; while in our office of editor we duly regulate the display of the various fragments of this life-history, contributed by each such witness, and with diligence strive to show the relations of these parts to the continuity of the whole; and, as seems fit, descant on the nature of this human existence—this man, Miller, in his relation to the organism enwrapped in which he during the present has being.

Miller's life was transacted under circumstances which justify the consideration of it as divided into three periods.

The *first period* comprises the history of his generation; his childhood; his youthful days; his early manhood up to the age of twenty-four years.

The *second period*.—The history of the second period is the history of the development of mature manhood; the time of life when a man's individuality is most characteristically displayed. At the close of this period Miller was aged thirty-seven.

The *third period* comprises a period of five years passed by Miller under circumstances which render this a most significant portion of his existence; he endured two very severe

illnesses; he married; at the age of forty-two he murdered his wife. He was then virtually adjudged by his fellows to be of such peculiar individuality—of such “Insanely” peculiar individuality—as to be unable to discharge his duties as a member of the commonwealth—as to be, in the commonwealth sense of the term, irresponsible for crime or other actions committed by him.

The narrative of Miller's life is as follows:—

PERIOD I.

Miller's Generation.—Archibald Miller was born in a farmhouse near Gourrock in the year 1831. He was one of a family of eleven. His father was a hard drinker; he “drank himself to death.” His mother had a very severe fright before the birth of this son; she found one of her children lying beside her dead one morning. She could not clearly account for its death, and in consequence of this occurrence she “got into a very nervous state;” she never slept soundly while “nursing Archy,”

Miller's Childhood.—*His mother narrates of him*—He was very delicate as a child; he could not walk at the age of seven. One day, when aged seven, he was lying on a mattress before the door of the farmhouse when a horse in passing kicked him; so that he became insensible, and was long of recovering consciousness. “He had two bad fevers before he was ten.”

His Mother loq.—“I thought my son Archy weakminded, and people coming about the farm used to remark that ‘he wanted a part.’ He had a brother, six years younger, and he used to take a sort of charge of Archy. In going about the cattle William, the younger brother, used to take care of him.”

Again—“*By the time he came to boyhood, I had great doubts whether he could learn a trade, as he was stupid; other people made remarks about him.*”

Miller's boyhood.—At the age of fourteen the mother, though greatly doubting if her lad could learn a trade, apprenticed him to a carpenter; he served his apprenticeship. A cousin thus speaks of Miller at this period of his life,

"I saw him often as a boy, and he was a stupid boy—he was a soft, silly laddie; when in the school we could not be bothered with him."

Miller's adolescence.—His mother says that as he grew up, "He took strong feelings of dislike against his best friends. He used to vow vengeance against his sister-in-law, and her children, and myself, and his aunt Margaret in Gourrock. He used to tell me that he had met his aunt or some of his friends in the street, and that he could not speak to them; he told me that he wondered how he was so glad to see them and yet he could not speak to them, and that the tears came into his eyes when he met them."

Miller's early manhood.—In youth and early manhood Miller's disposition seems to have been of an unsettled but not dissipated caste. His mother describes him as "shy and retiring, and something like what he was as a boy." He wandered about from one employer to another till, at the age of twenty-two, he went to Glasgow and entered the employment of a large carpentering firm in that town.

The account of his early manhood existence between the ages of twenty-two and twenty-four is given by fellow-workmen.

Miller was always considered "a very strange sort of man." He was not considered a first-class workman. He displayed the unsoundness of his organisation in various ways. He was extremely irritable; the apprentice boys who worked at the same bench used to say "they were near enough him." He had hallucinations of hearing and expressed delusions. He "went on the spree," and when "on the spree" was extremely irritable, impulsive, and dangerous; he was easily affected by drink. He on more than one occasion attempted self-destruction.

As illustrating Miller's life-conduct at this period (æet. 22, 23), I shall give the narrative of a fellow-workman, his fellow-lodger and intimate associate—"I knew him for six months before he enlisted. He was a man that was always going on the spree, and I used often to meet him." "When drunk he was a fair maniac, quite dangerous." "I was with him immediately before he jumped into the

Clyde. He and I met at Mrs —, at Minerva Street. He went for a chair of Mrs — to the cabinetmaker's." "He had quarrelled with the cabinetmaker about charging so much, and he (Miller) appeared at Minerva Street with his face bloody. He met a rivetter in Minerva Street as he was crossing to me, and brought the chair down on his head, and knocked him flat on the street. The rivetter gave him a good thrashing." "Archy then went to —, and I went with him to the close mouth and waited for him. He came down in a short time, and passed me like a madman without speaking a word." "I got home three or four hours afterwards, and I found Miller in bed." "R—, my bed-fellow, was laughing at Miller having been in the river. He laughed, and said that Archy had been to drown himself." "He (Miller) had been on the beer on the Friday night, but he had been working before that." (The suicidal attempt was made on a Saturday, and the man who rescued him said, "I dont think he was the worse of drink when rescued from drowning; when rescued he had to be forcibly withheld from again throwing himself into the water). "I was asked to remain with him and take charge of him." "They were feared for him taking his life. I remained with him until he enlisted. He was in a poor state. On the Thursday he enlisted. He did so without telling me."

Between the ages of twenty-two and twenty-four, in his primal manhood, Archibald Miller manifested himself as of such individual peculiarity as to render him an object of remark to those about him. We would discuss these manifestations of individual peculiarity. Miller is at this time described as of a reserved, taciturn disposition, easily irritated. A companion says of him, "When he was sober he was a quiet enough man, but he was a man that I would not like to interfere with." The apprentice boys were afraid of him.

He had hallucinations of hearing.—He used, when working, to hear voices speaking to him under his bench.

He had delusions.—He once made a great to-do in the shop by announcing that the sub-foreman was killing the foreman

in an inner room, and would not be satisfied that his notion was foundationless till he had been to see. He had these hallucinations and delusions when quite sober. That is—He, in his ordinary state of mind, on entirely inadequate grounds, as appeared to others, formed opinions of the value of which he was so convinced that he did not hesitate to take action thereupon. The delusions of the “Insane” are never without some chain of cause and effect, are never *groundless*: so, when Miller went to see why the sub-foreman was murdering the foreman, his cranky mental machinery doubtless forged, from a material of impressions received from some quarter, a wildly-linked chain of ideas, which, trained the incompetent-to-judge Miller to a conclusion the most rational he was at the time capable of reaching; though such conclusion was an “Insane” delusion to the intelligence of his fellows, and, indeed, would have been incredible to himself in his more “sane” moments.

It may be said, then, that this creature (creature, *creo*, the work of the Creator) Miller, in this phase of his existence, was endowed with an organism of such quality as to present him constantly with ideas of his surroundings different from those presented to his fellows of the same surroundings by their organisms. The capacity of any creature's organism is not a constant quality of that organism, it varies constantly and infinitely; but at certain times in the lives of all, their conduct evinces a series of periodic tidal flows of organic energy; then the characteristic features of character are prominently displayed. It would seem that such vital tides are most manifest in persons the characteristic of whose organism is intense impressibility and excito-motor facility—in such persons the power of self-control and judgment are frequently markedly deficient. Of such an individual, I have, in a paper formerly published in this *Journal*, remarked,—“The great feature of her personality is an extraordinary sensual sensitiveness and an uncontrolled display of its *excito-motory* results, in which the whole *nervo-mental machinery* shared.”*

* Vol. vi., p. 156.

Miller, a man of intense organic impressibility, at periods of irregular occurrence, passed through certain phases, in which all his individual peculiarities were displayed with exaggerated vehemence. The only authentic account of Miller's conduct during one of these exaltation periods is given at p. 181 (see *ante* "as illustrating"). During these times, Miller displayed *in exaggeration* all his infirmities. He also at these times drank; and on several occasions attempted self-destruction.

He drank.—For all purposes of this present review, it is of the utmost importance to form a right conception of the nature of these drinking bouts.

Were these drinkings the foolish characterless tipplings of a weak-minded creature, of no self-control, seduced by evil companions? They were not so. For weeks and even months, Miller, the unsociable, irritable, and taciturn, would keep sober; and when he did "go on the spree," he gave up all employment, and devoted himself to drink. There were the elements of a certain greatness in the wild energy with which Miller went to drink.

Were these drinkings the determinate, deliberate abandonment to sensual enjoyment of the low-type man? They were not so. Miller himself said that he could not resist the craving for stimulants which at these times came upon him, *a statement confirmed by the observation of others.*

The craving for drink was only one of several manifestations of a constitutional state. On the occasion cited above, he had had but little drink, yet his feverish irritability was such that he, unprovoked, struck down a stranger in the street, and again rushed past his friend like a madman on his way to commit self-destruction. When rescued from drowning, he was said by his rescuer *to be sober*; and, sober, had forcibly to be withheld from again throwing himself into the river.

We here conclude the first period of our "Insane" Biography—the first act of this life-drama—nay, rather life-tragedy. We have seen Archibald Miller—*The infant* begotten by a father of dissipated habits, who drank himself

to death; borne by a mother in a state of temporary nervous impairment; *The child* of weakly health and mental deficiency, led about and "taken care of" by a brother six years younger than himself; *The lad of fourteen*, whose mother greatly doubted if he could learn a trade; neglected and set aside by his associates, already being noted as incapable of a proper self-assertion; *The adolescent* of "Insane" irritability—of "Insane" impressibility—who displayed the peculiarities of his "Insane" individuality at one time in the expression of ill-founded, not foundationless, dislike to his near relations; at another, by his inability to restrain the evidence of tearful emotion on the ordinary chance occasion of meeting such relatives in the street; who himself wondered why he should be so moved; *The young man*, more and more manifesting an individual peculiarity which rendered him obnoxious to the notice of his fellows, as a man who did not conform to the ordinary standards of "Sanity;" who at ordinary times was considered a strange irritable man—a man "dangerous to meddle with;" who was possessed of an organism in the action of which the influences of those vital tides, which are noticeable more or less in all, are emphatically displayed by methods of conduct so extraordinary as to mark the man of "Insanely" peculiar individuality; to suggest the possibilities, nay the probabilities, of his individual life-conduct; and throw light on the mechanism and true nature of the less emphasised eccentricities of more "Sane" mortals.

We have, in the foregoing, attempted in words to present a period of human existence—a portion of the life-history of a being created as are all his brothers of mankind by the fiat of Him for whose *pleasure* "all things are and were created." This man as his individuality unfolded itself, as of especial susceptibility to all impressions, was so constituted as to be incapable of leading a life of ordinary tenor. From childhood he was the subject of remark. By his early playmates he was considered "a soft, silly laddie," with whom they could not be bothered, and with whom they did not bother themselves,—and so they played their part. He

grows to manhood; his sensitive impressible nature evolves itself more and more, as of "Insane" peculiarity; he is the butt of some; an object of fear to others; at times his wretchedness was so very great, that he strenuously attempted self-destruction.

Picture the sort of life this man must have endured. His mother pitied him; his friends remarked upon him; his playmates "could not be bothered with him;" the associates of his opening manhood made his misery the subject of mirth; and when in his madness he blindly (the word is used advisedly), *blindly* caught at a final remedy, they laughed at that.

Miller at the age of twenty-four stands on the threshold of manhood; a man of confessedly "Insane" individual peculiarity; of extremely impressible nervous temperament; displaying this abnormality of his temperament—in the expression of "delusions," in the confession by him of hallucinations of hearing—in a constant mental deficiency. The course of his life was at intervals interrupted by wild outbreaks, during which all these peculiarities were displayed in exaggerated form;—He was easily and wildly excited by drink—violent, aggressive, suicidal. He failed to commit actual self-destruction; he entered the army.

PERIOD II.

Miller's Matured Manhood.—*Fellow-Soldier* *log.*—"It was the common report in the company that Miller had a sunstroke." There do not seem to be good grounds for this rumour; this was the company's theory to explain the unruliness of Miller's conduct. "He had eccentric habits generally; he walked about in an eccentric way, throwing his arms about; he would get into still fits, and would not speak when spoken to. Miller had always a strange look about him, even when he was sober." "He was thought eccentric by the men generally." "I thought him touched in the head when I saw him laughing to himself." "I saw him on sentry at Allahabad on one occasion; he was calling out that the enemy were there. He thought he saw soldiers. The guard turned out.

I attributed this to his eccentricity." "He told me he was precentor in a church at one time; he told me this when sober." "I have seen when there were a lot of us drinking together and some of us talking, Miller would think we were talking about him, and he would come and give us a blow." "I have seldom seen him drunk. I have, however, seen him when he had drink, and he behaved like a madman. I used to think the drink took more effect on him than anyone else." "When he was out of drink he was very quiet, he would sit for hours and never speak. I did not like to see him when he had drink; there was a strange look about him."

Miller served in various parts of the world. He was discharged from the army in July 1868, he was then aged thirty-seven.

In the foregoing, very succinctly is pictured a matured manhood, the natural outcome of the "Insanely" peculiar childhood, boyhood, adolescence, and primal manhood. The displayal of marked individual peculiarity more and more engages the attention of this man's fellows; his fellow-soldiers now, as did his fellow-workmen in days gone by, remark him as a man "eccentric," a man apart.

The reader will note in the account of this second period the correspondence in form, the difference in gravity of the manifestations of this "Insanely" peculiar individuality, as it gradually unfolds itself.

PERIOD III.

When discharged from the army Miller was aged thirty-seven. He came to Glasgow, and there enacted the last scene of what may truly be called a most tragic life. The last scene of this true tragedy occupies a period of about seven years, and gloomily closes with the murder by him of his wife.

The narrative is as follows:—The circumstances of Miller during this period are shortly—He began to work with his old employers, and lodged in the family of one of his fellow-workmen; he married in December 1869; he had a very severe attack of renal dropsy in October 1873; he murdered

his wife in May 1874. So much by way of outline sketch; now, to complete the picture. We shall, as before, leave the witnesses, many of them Miller's intimate associates during this time, to speak very much for themselves—merely in the office of editor inserting compressed narrative when such a method helps to clearness of view.

Mrs A.—"I have known A. Miller for eighteen years. When he came home I did not see much of him; but he used to come to the shop and crack with us. I noticed a change in him. I thought him quite a different man, and not very sound. *I thought him silly*, and not the least what he used to be."

Mrs B.—"This person's evidence may be called the back-bone of the narrative of Miller's life up to the time of the murder. She received him as a lodger before his marriage. She was intimately acquainted with his wife. She was acquainted with the Millers during their married life, and she was Mrs Miller's intimate friend, to whom was confided the history of her domestic life and anxieties. We shall therefore allow this woman to act as chief narrator, summoning others to confirm or elaborate her account when it is necessary to do so.

Mrs B. loq.—"I have known A. Miller about six years. His sister is married to my husband's cousin." "He lived with us for about eighteen months. He took a spree occasionally, but I have seen him quite steady for six months, eight weeks, and ten weeks at a time. He was not a sociable man. *He had a childish silly manner.*" "*His fits of drinking came on like a disease.* His wife told me this too. A day before the pay he would be awfully communicative, whistling and happy like. He would be making promises of doing great things in the future, and these were the very times he went on the spree. When he was sober, he was very quiet. He would sit in a room without speaking to anyone for a long time, and he declined to be introduced to people. He was vicious and revengful in drink, and after the drink he was melancholy. The only time he was happy was before commencing to drink."

While Miller lived with Mrs B——, he on three occasions attempted to destroy himself.

Attempt to commit suicide.—"A short time after that," (another like attempt) "and I think in February, 1869, he was a little the worse of drink when his brother William called, and Archibald commenced lamenting the disgrace he had brought on the family, and saying that he was the black sheep of the family. William tried to soothe him, but he suddenly got up and rushed out of the house, saying that he would go and drown himself." He rushed out to drown himself, but was "coaxed back" by Mrs B. and his brother. On two other occasions Miller's attempts at self-destruction were more determined. I have chosen to present the account of this attempt, as it is distinctly mentioned that he was "a little the worse of drink" at the time.

Delusions and fear of unknown agencies.—"In the beginning of the winter of 1869, we heard him making a noise in his room one night, and I went into his room and found him in his black trousers and white shirt, and he said he must go and see his sister Margaret Ann about the deed he had committed, to see if she would conceal him. He said they were after him, and that he was to be taken before the Sheriff, and then it would depend upon what I said whether he was condemned. He would not go to bed, and I had to sit with him all night. He insisted on looking out at the windows to see the crowds that were on the lookout for him. He would not go to his work next morning, as he said there was a description of him in the papers. I had to show him a newspaper to satisfy him that there was not."

Murderous threats.—"Many a time in his sober moments he has said to me that he would commit murder yet. I remember on one occasion that he said he would never be content until he wrung his hands in the blood of his sister-in-law and in the children's. I threatened, when he said this, to give him up to the police, and he became quite quiet." "When he said to me that he thought he would commit murder yet, it was a general threat, and not meant against any particular person. I thought him of a very strange

disposition when he said so. "He has threatened his best friends, his mother, his sister, and myself."

On the 11th November, 1869, Miller had a severe attack of renal dropsy; his medical attendant, Dr T. Drysdale Buchanan, reports that he was very ill. The attack lasted six weeks. "He had not tasted drink for six weeks before."

On recovering from this sickness he was married.—It will be perceived that now Miller's life-conduct is to be transacted under modified conditions. A question arises in his life-problem. How will he, with this markedly peculiar temperament of his, manage to make due allowance for the working give and take which close and constant communion with another entails? The writer of romance might here present an entrancing picture of an irritable unhappy mortal, soothed and guided in peaceful ways by the gentle ministration of a devoted wife. We have to do with a story of real life—a story of madness, misery, and crime; a story of "a wretched," "Insane," "good-for-nothing" "old soldier," and of the char-woman, his wife; who actually married him for love, and, as far as can be seen, did truly keep her marriage vows to him, loving him always, honouring and vindicating him to her friends, and cleaving to him at the constant risk, and finally at the cost of her life. As the story goes on, it is very wonderful to note how every now and then through the lowering atmosphere soft gleams of gentle sun-light break—expressions of conjugal love and filial yearning, imaging forth the Divine that dwelt in the "Insane" criminal Miller as in all men—and presage for this "crazy" mortal too a Heaven—another and advanced Phase of Being; when, having absorbed the lesson his mortality was meant to teach, he shall put off the earth garment, and know with a further approximation to that knowledge wherewith he is known by his Maker;—know with a knowledge, it may be, the outcome of the stores of material which his "Insanely" impressible brain had, during his mortal existence, stored as unconscious, and for the time by him unusable experience.

We proceed with the story of a man who was fondly

attached to his wife, and who in the infirmity of his nature murdered her.

After marriage.—The general tenor of Miller's life after marriage was much the same as before it. But certain special manifestations of his "Insane" individuality were educed by the more social scheme of life consequent on marriage.

Take the following as a sort of indication of the constant condition of mental impressibility and irritability in which this man lived.

Mrs B. log.—"One fast-day Mr and Mrs Miller went with me and my children to Kilbarchan. We were too soon for the train, and waited at the station. Mrs Miller told me afterwards that her husband had seen her likeness hanging up at the station, in a photographer's case, and he thought it was hung up there for the purpose of letting people know where to find her, and he threatened to destroy the case. It was all a delusion; the likeness was not her's at all."

Outbursts of "Insanity" continue.—Miller continued to have these outbursts of drinking, which "came upon him like a disease," and he used to threaten to murder his wife. In the month of November 1871, Mrs Miller left her husband for three months; she went to Edinburgh. During this time Miller worked steadily, and had no drinking bout. In February Mrs Miller returned, and the couple again lived together.

In March 1873, Miller sustained a very severe cut on the head. Dr Buchanan, called in to see him, found the wound bleeding profusely, but Miller would not allow it to be dressed, until, from loss of blood, he became so faint as to be unable longer to resist the doctor's good offices. He was under the influence of liquor. At this time Miller expressed to Dr Buchanan great anxiety as to his wife's welfare.

Dr Buchanan log.—"After he was convalescent from the attack, he had commenced to drink again, and I was called in by Mrs Miller, who stated that he had attempted her life.

and that he had a knife and razor concealed under the pillow for that purpose. He was in the house at that time, and he said *he heard voices speaking to him.*"

Miller wanders away.—In the beginning of July, 1873, Miller went amissing, and remained away for seven weeks. No explanation of his conduct at this time has ever been given. We present one or two notes which seem to throw light on his "motives" (*i.e.*, what caused his actions—a mere impression and result affair, not necessarily involving what can be called deliberation). He had gone to Ireland, and while wandering about there in a state of utter destitution, wrote to his mother as follows:—"My God, what I have suffered for you. It has surely been for a punishment I have been sent here." He went to Ireland in accordance with his own ideas, and as soon as his relations heard of his whereabouts, they sent him money to pay his way back.

On his return from Ireland, he was again affected with renal dropsy. He was a patient in the Royal Infirmary. I shall, as shortly as possible, give an account of him while there.

Mrs C., day-nurse, depones.—That Miller was bedridden—that he had to be fed—that he was dirty in his habits; he constantly soiled his bed, and would not use the stool—that he was neglectful of the requirements of decency; he would strip himself naked, and sit so by preference—that he suffered greatly from thirst, and when offered milk asked for beer. When he came in at first he was very restless, and slept very little, but latterly he sank into a sort of stupid state, and slept a good deal. Again, subsequently.

Mrs C., nurse, loq.—"One morning, about a week before he left, Dr Perry, when he came in, asked him if he had been in the bath this morning, and he said he had, and that he had also been at Buchanan Street." He was unable to stand at this time.

A Fellow-patient.—"He talked about a great many things that there was no truth in. He said that he and another man were going to pull a boat-race on the Clyde for £25. I said that he couldn't pull a boat. He was lying on his

back, and made signs with his arms and face as if he was pulling a boat." Miller, while in hospital, frequently expressed great affection for his wife.

He was discharged incurable on the 8th October. Dr Perry on his discharge stated, "It appeared to me doubtful, whether he would ever regain sufficient mental and bodily vigour to take care of or provide for himself."

Convalescence, mental state, sleepless.—When removed from the Infirmary, Miller was placed with a Mrs D— to be nursed. While with her, he in great measure regained his former health and strength. Mrs D. noticed during his convalescence that he was rather sleepless, and talked a great deal to himself through the night. His appetite was very great. She says, "He had the look of a man that had a want, and his manner and conversation was not like a rational man. He was always timid and avoided notice."

Early in January 1873, Miller went to live with his wife in the club-house of which she was housekeeper.

Murderous attempt.—On the 29th April, Miller again attempted to murder his wife; before going to bed he had been "extra" kind to her. When she got into bed he arranged her pillow, and made her comfortable. He then seized her, produced a knife, and said she must tell him all that the treasurer of the club had been saying to her, and—"Now your deeds are all to be summed up to-night in one dish, and my mother's and my own to-morrow." Mrs Miller pled with him for life. She got up to get him some whisky, and when she left him, she heard him fling the knife violently against the wainscot.

Dr Buchanan saw him next day. He says, "From his appearance at that time, I was strongly impressed with the belief that I would be in danger if I were left alone with him. I would not have remained alone with him for any money."

Condition the day after a frenzied attempt to murder his wife.—On the 30th April he went to see a fellow-workman, and spent the night in this man's house; his condition the day after a murderous attempt is described by this man and his wife as follows:

Mrs G. loq.—"He was in a dazed state, not drunk." "He spoke sensibly enough; he was not excited in his talk." G—— went out. He says, "Before I went out, he began to get very nervous and shaky." He prayed Mrs G. to give him money to get a glass of whisky. She did so, and he was "shaking" when he went out. Miller became more cheerful as the evening passed, and he and his entertainers sang songs and criticised each other's performances. "He wanted (hesitated) very much, and was very slow in telling." He passed a sleepless, restless night. "I had asked him several times the night before how Mrs Miller was and where she was; *he never said, but gave an evasive reply.*" As Miller was so ill, Mrs G. asked if he would like to see anyone, and suggested his mother. Miller said, "Surely she would not refuse to do something for me; surely she'll not see her own flesh and blood without a place of safety for fear I will put hands on myself and take my own life." Miller was noticed to suffer much from nervous tremor. He complained that he had passed a miserable night, "his mind had been occupied by trifles;" he could not bear the light.

Dr Buchanan again called to see him, and formed a very unfavourable opinion of his mental condition. He told Mrs G. to put the children out of the way, and to hide all knives, &c. After this he became very irritable, so much so that Mrs G. was afraid of him.

We here quote the last passage drawn *verbatim* from the accounts of witnesses. Dr Buchanan by way of summing his opinion of Miller, as formed on three several occasions on which he attended him in a professional capacity, says, "When I saw him in April 1873, he was under the influence of liquor. When I saw him in the club in April 1874, and afterwards in Mrs G.'s., after making a murderous assault on his wife, I considered him quite unsafe. On neither of these occasions was he drunk. He was like a man labouring under a paroxysm of madness the time I saw him in the club. He had a strange wild look, and gave short snappish answers. I would have certified him at once as an insane person that day."

Miller was sent to the Belvidere Fever Hospital, was found not to have fever, was consequently little seen by the authorities there, and was dismissed on the 20th May: the murder was committed on the morning of the 25th.

Miller's condition in the interval of his attacks of periodic excitement.—One noteworthy point in regard to this narration is that between his attacks of irritable excitement, Miller was *biddable and facile*: thus when ordered out of the club by the secretary, when hectored and threatened with the police, he merely complained of the hardship of being separated from his wife. It must also be remembered that it is quite possible that witnesses may have been mistaken when they thought on various occasions that Miller was under the influence of drink: it is a mistake too apt to occur in such cases: all eccentricity and abnormality of conduct in such a man is apt to be attributed by such witnesses to drink—the great disturber, it may be, of their own equanimity.

We would now invite the reader to consider this man's individuality. He may be said to have manifested his inability to play his part as a citizen of the commonwealth, when, on the 15th May, 1875, he perpetrated a murder. It seems well before passing to a consideration of the motive which produced such a catastrophe to take stock of the man who was the author (?) of it.

The present is the æra of classification—of materialism. Let us therefore review this "Insane" individual Miller—let us with considerate eye take stock—of his foolish infancy—his strange childhood—his more and more eccentric youth—his formed Insanely peculiar manhood; with its marked sensitiveness, displayed in constant irritability and suspiciousness, in sudden, unexpected outflowings of tenderness; with its wild fancies; with its periodic outbursts of reckless, aimless, passion, mad wild-drinking, murderous threats and suicidal attempts; and for goodness and peace sake, get his "case" properly docketted and deposited in some classification pigeon-hole, far enough removed from that wherein reposes our own pedigrees. If no other end be gained by a classification of "Insanity," surely a very considerable thing is effected,

if it be made out that we, the onlookers, and he, the "Insane" actor, belong to different classes. A laudable object this! We would consider Miller's individuality somewhat from the "classification" point of view.

Miller's "Insanity" was certainly the natural outcome of the evolution of his "individuality."

The editor of this, on a former occasion, ventured to suggest that he had found his conception of that "Insane" individual peculiarity, where the "Insanity" is the natural evolution of the individual organism, facilitated by considering three principal ways in which such an "Insane" condition of organism seem to be produced. If this be classification, it is certainly a very easy-fitting classification.

The three ways are—

"1st, By gradual evolution among the progenitors through various degrees of individual sane peculiarity, each degree differing more from the standard of sane individuality, till at last the individuality is recognised as insane by universal consent."

"2d, The insane individuality may be developed by the influence exercised on the offspring by a specific temporary period of ill-health, affecting either parent while concerned in the procreation of the offspring; and this period of ill-health may be entirely abnormal to the parents' original constitution, transitory, and non-recurrent."

"3d, The insane individuality may be evolved by the influence of injury or constitutional disorder occurring in the life of the patient. In such cases, in the first instance, influences extrinsic to the organism must be held as causative of mental disorder; but these extrinsic influences produce such grave constitutional effects, that subsequent attacks of mental disorder arise from an intrinsic constitutional state, the result of influences extrinsic to the organism. The individual organism becomes so warped that it subsequently evolves itself as of insane peculiarity, although the general health may be entirely re-established, and remain good."

The setting up of such divisions as anything more than conveniences for getting clearness of view in such matters was repudiated; a conviction was stated that all classification of disease, as of all natural phenomena, was a necessary evil, and was at once a help and an offence to the limited intelligence. The present is an instance of the truth of this. The Miller who committed murder was possessed of an individuality, the "Insane" peculiarity of which is traceable to influences belonging to each of the above three divisions. Still clearness of comprehension is gained by turning on the condition of Miller the illuminating power of the morsel of truth contained in such *a method of viewing* the matter; by considering these three sets of influences which contributed to mould the Miller of our story.

Miller's father was of drunken habits, and died of hard drinking—However necessary, from a legal point of view, it may be to differentiate between the eccentricities of an habitual drunkard and the irresponsibilities of a madman, it is becoming understood more and more that nature does not endorse the legal decision. She displays many a man allowedly "Insane," the immediate offspring of a *drunken* parent—a parent not "dipsomaniac" or "insane," but of "drunken habits." What is the relation of the "insane" offspring to the "sane" but "drunken" parent? Is he an unconnected link in the chain of being, or a like springing from a like. It seems more and more not only true, but becoming demonstrably true, capable even of demonstration, that "Insanity" is the result of an aggregation of choosings, not to imagine, think, do right,—a prolonged series of moral suicides; in consequence of which the power of the organism to act truly, to represent truly, becomes more and more impaired; this organic impairment tends to increase in successive links of chains of organisms till the final descendant may become an apparently soulless idiot—a sort of register of the *sins* of his stock.

As the Insane son of an habitual drunkard, Miller may be rightly held as possessed of an "Insane" organism by evolution from his progenitor.

Miller's mother, before the birth of this son, got into a very

nervous state, and the offspring born of her was different from the rest of her children.

We would here present a small piece of two "Insanely" peculiar pedigrees, which seem to us to have a sort of mutually illuminating influence. We number them 1 and 2.

(1.)

Miller's Pedigree.

<i>Father.</i>	<i>Mother.</i>
Extremely drunken; drank himself to death.	Usually healthy; while pregnant with "Insane" child was quite un- strung from the effects of a severe nervous shock.

Only one child, Miller, marked as "Insane;" his Insanity consisted in want of control over an intensely irritable susceptible nervous organisation: as he reached manhood, he developed "Insane" drinking as a phase of character.

Family all of remarkable intellectual acuteness and energy; but the "moral element" *deficient* in all.

(2.)

Other "Insane" Man's Pedigree.

<i>Father.</i>	<i>Mother.</i>
Drunken and debauched; of great natural abil- ity, in virtue of which he achieved for himself a pro- minent position; a reckless, unscrup- ulous, hard-head- ed, hard-fisted creature.	A woman of no strength of char- acter.

One member of family "Insane;" a sharer in the general family attribute of intellectuality; but allowed "morally Insane"—an "Insane" drinker, the inmate of an asylum, of markedly deficient self-control.

An "Insane" man appears as final shoot of both these geneo-logical trees; the process of growth in each is wonderfully similar; the "Insane" branches are natural products of the parent stem.

In Miller's generation, the father was the originally defective member; the mother was calculated to produce "sane" offspring; the majority of her children were of "sane" individuality; but *once* her organism passed through an "Insane" phase, its vigour was impaired by transitory influences—the child then born of her was of "Insane" organism; the general cast of his character is referable to his mother's transitory nervous condition; his special outbursts of "Insane" individual peculiarity reproduce the "vices" of the habitual drunkard, his father.

In the other "Insane" man's generation, the father was the strong "vicious" impressive individuality; the mother's nature was permanently that of Miller's mother in her

"Insane" transitory phase. The individuality of the "sane" intellectual members repeat the individuality of the father with little change. The individuality of the "Insane" scion is the individuality of the able, worldly-wise father repeated emphasised. What a state of matters—No. 1 "Insane," the natural little modified outcome, on a chance occasion, (during the mother's "Insane" phase) of a poor weak "drunkard," was a poor, weak, excitable, "Insane" man, and "Insane" drunkard. No. 2 "Insane" man, the natural, little modified, outcome of a strong-willed (the mother a woman of no strength of character) exceedingly able, much admired, intellectual, dissipated, "sane" drunkard, was a weak-willed, exceedingly able, admirably intellectual, morally "Insane" drunkard; and one of a family of similar characteristics, but not held "Insane." Sane, clever, rather unscrupulous, people—not very truthful—might even go the length of sanding their sugar, or putting their thumbs into their measure, or grasping their neighbour's hand and grinning pleasantly with feigned friendship in their neighbour's face, while inwardly plotting his mischance. Alas! what of classification and pigeon-holing of cases of "Insanity" now! Truly when one pauses a moment, and not considers, but merely gives place to the lessons which are waiting to rush in on all sides from the unseen of God around us, the intelligence blanches before the crowd of thick-coming, not fancies, but pregnant facts. It has been said, "Nature, which is the garment of God, and reveals Him to the wise, hides Him from the foolish." He is the wise man who, with the docility of a child, and the unself-seekingness of a righteous man, *contemplates* the works of the Universal Creator—he is the foolish man who virtually denies that the invisible things of the Divine are to be understood from the things which are made, and proceeds to extract a spurious meaning from the works of Creation.—Such become vain in their imaginations, and their foolish hearts are darkened. The attitude of the observer must not be of the one with his "Lord, I thank Thee that I am not as other men are; I do this,

that, and the other:" but of him more worthy, who smote upon his breast and said, "Be merciful to me a sinner." "Insane" men are the handiwork of the Creator and Worker, whose ways are not known; and their life-histories, as do the life-histories of all men, rank among the Scriptures of God.

Miller belonged to the third sub-division. His general bodily and mental vigour was considerably modified by the effects of the Infirmary illness. He was a man more "Insane" after than before that occurrence in his life.

Miller was subject to seizures of petit mal, preceded by a distinct aura.

I would sum up the features of the foregoing life-history in the following propositions:—

I. Miller immediately derived his "Insane" organism from parents who, at the time when he was begotten and born, were in an "Insane" condition.

II. In childhood he was markedly "Insane," both as regards his bodily and mental health. On reaching manhood, and during the greater part of his manhood, his bodily health was tolerably good, but his mental manifestations were of a markedly "Insane" character. He was markedly impressible, suspicious, expressed delusions, experienced hallucinations of hearing, threatened violence.

III. At certain periods his Insanely peculiar temperament manifested itself with great vehemence. He at these times manifested a craving for strong drink, which "came upon him like a disease." He was dangerous, murderous, and suicidal.

IV. He presented certain evidence of the epileptic diathesis. Persons of this nature are characterised by the suddenness with which action follows an impression received by them. When "Insane" they are peculiarly dangerous, and their "Insanity" frequently displays itself in paroxysms of extreme, and apparently causeless violence.

V. He was subject to hallucinations of hearing. "Insane" persons subject to such deceptive impressions are admittedly apt to have recourse to extreme violence—to be murderous or suicidal.

VI. Before the occurrence of his "Insane" paroxysm, he always experienced a *happy* excitement; at other times he was of a melancholic disposition. In the *Edinburgh Medical Journal* will be found a notice in a paper entitled, "The suicidal tendency, as manifested in asthenic insanity" of periods of *happy* excitement, premonitory of such recurrent "Insane" paroxysms. It is, we believe, the only occasion on which this premonition has been noticed. It seems valuable as showing the "Insanity" to consist of a periodic physiological excitation of the brain, which many find manifestation in various ways. The variety of form argues a total inability of the controlling power to cope with impressions of any kind presented to it by an organ in an abnormally impressible, excitable condition.

VII. Shortly before the occurrence of the catastrophe which concluded Miller's term as a citizen of the commonwealth, he in the Infirmary received a constitutional shock which rendered him more than ever an "Insane" man; the impressibility and instability of his mind were exaggerated his power of self-control was still further impaired.

We now pass to consider this "Insane" Miller in his character of Murderer.

The crime was committed on the 25th May. Miller took lodgings on Saturday the 23rd, with a Mrs F——. He chose these lodgings that he might be near his wife.

Mrs F—— loq.—"Shortly after this I asked Miller how he would like to have a wife like me that would not give him any money, and he said he had a very good wife, and that she was very kind to him." Miller was not drunk, he smelt of drink, but was not drunk. Other lodgers agree that he was quite sober from the time on Saturday when he first came to the lodgings till the time on Monday when he finally left them.

Sunday he is supposed to have spent with his wife. On his return to his lodgings at 9.30 p.m., it is reported of him:—

"I did not think there was anything strange about Miller

till the Sunday night. His very eyes rolled in his head that night, and he appeared to be not quite himself. He was very raised like."

On Sunday night he complained much of pain in his head.

A Fellow-Lodger and Bedfellow loq.—"He slept very well on Saturday night; but on Sunday night he was restless, and slept very little. He appeared as if there was something preying upon his mind."

In regard to the above, we would remark that previous to the commission of the murder—a manifestation of extreme violence—Miller was under observation for more than forty-eight hours. He expressed a strong affection for his wife in act and word. He was not drunk. On the Sunday night he presented symptoms of nervous disorder similar to those described at page 193, as accompanying a similar attack of murderous violence. On this Sunday night he complained of pain in the head, and passed a sleepless night. On the former occasion (page 193), he also complained—"Oh, my head! my head!" and Dr Buchanan stated that he could not bear the light.

Miller immediately before the Murder.—Miller left his lodgings on Monday morning the 25th May, between six and seven. He was again under observation very shortly, or immediately before the murder was committed. He went to a wright's shop in Parliamentary Road about nine o'clock. His condition is described as follows:—"He had the same appearance as on Friday. He was not tipsy, nor was he smelling with drink." On the Friday he had called at the shop, and had been remarked as agitated and distressed looking.

In the house at Renfield Street—cries of "murder" were heard in the office below the club-room at about 10.30.

From want of space we are constrained to be brief in our account of Miller's proceedings on the Monday. We give a review of his state of mind:—When seen shortly before the murder was committed he was sober, but "agitated and distressed looking." At 11 a.m., immediately after the murder, he went straight up Renfield Street to a pawn-shop, and tried

to pawn his dead wife's blood-stained clothes; he was then sober. When the clothes were refused at one shop as being woman's gear, he tried again and again at shops in the neighbourhood of the house where his dead wife lay; and when unsuccessful, asked an old woman to pawn them for him. He by no means avoided observation. The pawn-broker did not notice anything remarkable in Miller's demeanour. There is no doubt that as the morning passed, Miller had taken drink. At 1.30 he went to a haberdasher's shop in the Cowcaddens and bought new underclothing for himself, which he proceeded to put on in an open close. He presented the blood-stained shirt which he took off to a scavenger. He let no chance slip of drawing public attention to himself—all this in close proximity to the place where the murder had been committed. Those who saw him changing his clothes thought him "a little the worse of drink; but otherwise he appeared to be a very decent looking man."

Miller's conduct during the day of the Murder.—Miller then went to a cousin of the wife's who kept a whisky shop—was refused drink; went to a man to whom he had pawned his tools, and, as was his custom when he had been drinking, had a quarrel with him. The man says:—"He was very excitable when I refused to give him money. He very often offered to fight me."

Miller finally finished his day's doings by taking a woman of infamous character to a lodging-house in the High Street.

His manner while here, and, indeed, through the whole of the day, was marked by a total absence of any desire to get out of the way, or any of the self-consciousness which a "Sane" man, after the committal of such a deed as murder, could not but have displayed. During that day, after the murder, we find him again the silly, doited, irritable, excitable mortal we have had knowledge of throughout the account of his history, especially of his recent history.

Miller finally, on Tuesday morning, stole a pair of trousers belonging to another lodger in the High Street house, and was apprehended. When taken to the police office, he was

recognised as the Miller who had been sought for on the charge of murder.

During the day there is only one period during which Miller's condition was not under observation, more or less constant—the period which elapsed between his leaving the wright's shop in Parliamentary Road, when he was noticed to be “agitated and distressed looking,” and the time when he was seen walking up Renfield Street with a bundle of women's clothes under his arm to the pawnshop. His whole demeanour and his course of action during the day were as if the recollection of the occurrence of that hour, from 9.30 to 10.30 in Renfield Street, had been dropt from his memory. The body of the murdered woman showed that she had made a violent struggle for life, and that the deed had been committed in a very brutal manner.

THE TRIAL.

We now pass to consider the trial of Miller for the crime of murder. This trial was a prolonged affair; it extended, indeed, over somewhere about five months. The judgment in this case which pronounced the final verdict was not that which was pronounced in the Circuit Court, but that which pronounced its verdict in the signing of the memorial to the Secretary of State. It was the verdict of the medical profession of Glasgow, backed up by the assent of the citizens of Glasgow.

In April 1874.—Dr Buchanan's opinion.—“When I saw him in the club in April 1874, and afterwards in Mr R.'s, I considered him quite unsafe. On neither of these occasions was he drunk.” When seen in the club, “I would have certified him at once as an Insane man that day.”

Thirty-six hours after the Murder.—Dr McEwan, in his official capacity, saw Miller in the police cell, at the instance of the Procurator-Fiscal. Miller then manifested the following evidence of unsound mind: He laboured under hallucinations of sight and hearing. He had delusions as to place. He was Insanely suspicious; imagined that his

beef-tea was poisoned. He was sleepless. He smelt somewhat of drink, but there was no tremor; indeed, the complexion of his mental disorder was not that of *delirium tremens*.

Drs McGill, M'Ewan, Strethill Wright, and Mr Johnston felt themselves justified in giving evidence for the defence in this case. The opinions of these gentlemen agreed in all essentials. That opinion was formed on a careful consideration—(1.) of the history of Miller's life up to his incarceration; (2.) of the evidence of his fellow-prisoners, his cell-companions; (3.) of Miller's mental condition on the occasion of repeated personal examination.

(1.) *The history of Miller's life* has already been given.

(2.) *While in prison*.—To give a detailed account of Miller in prison would merely be to recapitulate symptoms of unsound mind such as have been already given. Miller is described by his fellow-prisoners as being usually in a dull, apathetic state,—as inconsequential in his talk—as being intensely irritable when contradicted, then;—"His general appearance changes altogether. His face shrinks in as if he were wild"—as being very restless and sleepless at night. He ground his teeth and cried out at night in his sleep. His fellow-prisoners feared him; they were of opinion that while in the cell he was very anxious to commit suicide. To effect this purpose, he frequently expressed a great desire to get hold of the razor with which the prisoners were shaved.

(3.) *On personal examination* of Miller, the following symptoms of "unsound mind" were elicited. Miller's condition was that of partial dementia—there was general sluggishness of the mental operations—a slowness in answering questions—an impairment of memory—and a marked general apathy of manner. He described hallucinations of hearing and seeing. He expressed delusions. He repeatedly stated his conviction that the charge of murder was the result of a conspiracy against him, and that he was sure his wife was not dead; but that she would appear in court and clear him yet. He stated that in his suicidal attempts he did not

know what he was doing: "he found himself in the Clyde." He described his drinking bouts as unavoidable by him. He could not control his passion for drink, which came upon him at times.

Mr Johnston and Dr Wright further elicited an account of a seizure of the nature of *petit mal*.

It was agreed by all these medical witnesses that it was impossible that Miller could have invented the symptoms of mental disorder which he narrated, because the prisoner's evidence was verified by all that was known of his past history; and the manner in which the various symptoms were given precluded the idea of a made-up story. His evidence had to be extracted from him, and had then to be pieced into an intelligible whole.

It would have been very satisfactory could we have closed our duties as editor by giving verbatim the several opinions of the medical witnesses. Want of space forbids this. We, therefore, give an abridgment of their opinion in the following propositions:—

It was agreed that—

- (1.) Miller had all his life been "Insane," and was Insane at the various times when he was examined.
- (2.) That the nature of his "Insanity" was such as to render it probable that Miller was a man likely to commit such a crime as that imputed to him; and for which he could not be held responsible.
- (3.) That on a consideration of the history of Miller's life, the history of his conduct at the time of the murder, the symptoms of unsound mind elicited on personal examination, he was a man unfit to instruct counsel for his defence.

Mr Johnston and Dr Stretchill Wright were further of opinion, that the occurrence of *petit mal* was a most important feature of Miller's condition, as it is well-known that periodic Insanity of the epileptiform temperament is frequently distinguished by the suddenness and intensity of its manifestations; and that, after a careful consideration of concurrent evidence as to Miller's state at the time of the

murder, it was extremely probable that he then laboured in one of those attacks of periodic "Insane" excitement to which he is shown to have been subject; the admitted violence and suddenness of which was explicable as being the manifestation of a man of the epileptic temperament.

On consideration of the evidence which, abridged in the foregoing pages, has been laid before the readers of this publication, a jury found Miller guilty of the murder committed on the 25th May, 1874, and of sound mind at the time of that occurrence. Capital sentence was passed upon him.

"A representation was made to the Home Secretary, in a memorial signed by many members of the Glasgow community, and also of the medical profession in Glasgow, that "extenuating" circumstances existed which made hanging in this case not a just but an unjust recompense for the measure of guilt invoked *in this man's* commission of the crime of murder." Miller was respited during Her Majesty's pleasure.

From the above it would appear that, in fact, the trial of Miller was conducted by the members of the medical profession; that their verdict was that which recommended itself to the sense of the community, and, if we are not misinformed, to the more deliberate consideration of some members of the jury who found a contradictory verdict; the medical verdict was that which finally prevailed.

It now only remains to us, in closing this account, to apologise for a lengthiness which we trust is not prolixity. As to lengthiness, we would submit the plea of "extenuating circumstances." The gravity of the questions involved—as to the true light in which murderous attempts by men such as Miller should be considered,—and as to what sort of men are best qualified to decide the question of guilt in such cases,—seemed to warrant a minuteness of recount which should as far as possible relieve us from the charge of special pleading. We would remark that it seems to us anomalous that on the one hand the simple certificate of two qualified medical men should be deemed sufficient reason for warranting the

incarceration, for an indefinite time, of a man of such "Insanely" peculiar individuality, as to render him a nuisance to his relatives, or an offence to public decency. And yet, on the other hand, that the opinion of medical men, carefully formed, and confirmed by prolonged study of an "Insanely peculiar individual guilty of such an overt act as this murder, should in a court of law be so esteemed that a jury (of men certainly unqualified to form an opinion on a question of soundness of mind) gave a verdict flatly in opposition to the opinion of those who were, by special education, qualified to decide such a matter.

VI.—THE RESULTS OF AMPUTATIONS PERFORMED IN THE GLASGOW
ROYAL INFIRMARY DURING TWENTY-FIVE YEARS,
ENDING 31st DECEMBER, 1873.

By MOSES THOMAS, M.D., F.F.P.S., *Glasgow*; *Medical Superintendent.*

(*Read before the Glasgow Medico-Chirurgical Society, 5th March.*)

IN this paper I purpose giving an account of the results of the more important amputations performed in the Glasgow Royal Infirmary for a period of twenty-five years, ending 31st Dec., 1873. This will complete the statistical record of amputations in this Hospital from its opening in the year 1794. For nearly eighty years the Royal Infirmary has been the only general Hospital existing for the reception of patients belonging to Glasgow and the other populous seats of industry in its vicinity, and this monopoly, if I may so term it, has naturally rendered it a mine of valuable information, more especially as all its records have been on the whole very accurately kept. Part of its statistical information has been published at various times; but the statistics which more immediately concern the subject of this paper were first published by Dr Lawrie, the late well-known Professor of Surgery in our University, in the *London Medical Gazette* of 1840, in a paper upon amputations performed in the Glasgow Royal Infirmary, from its opening in the year 1794 to 31st December, 1838; and Dr Steele, one of my predecessors in the office of superintendent, and now of Guy's Hospital, London, continuing the record from the period at which Dr Lawrie left off, published an account of the four

major amputations to 31st December, 1848, in the *Edinburgh Medical Journal* for 1849. The statistics I now give include the whole of the amputations for a quarter of a century, viz., from 1st January, 1849, to 31st December, 1873, the last year in which it could be said that the Royal was the only Infirmary provided for the city and its neighbourhood. So far as I am aware, this will form the most complete record yet published of the statistics of one Hospital.

In his paper on Hospitalism, Sir James Simpson gives the statistics of the four major amputations performed in this Infirmary from the year 1856 to the year 1868, extracted from a volume of our annual reports which I furnished to him. It so happened that the statistical tables were absent from the report of 1849, otherwise the record he published would have been complete. This omission I now supply, and in addition have separated the whole amputations into primary, secondary, and for disease; following the course pursued by Drs Lawrie and Steele, and by medical statisticians generally. Moreover, I give the further experience of the five succeeding years, viz., from the year 1868 to the year 1873, a period fraught with immense changes in the Hospital; for not only had the antiseptic method of treating wounds come into almost general use, but several important structural and other changes were at the same time made by the managers, all tending to improve the ventilation and increase the salubrity of the different surgical wards.

Before proceeding to the immediate subject of this paper, I will briefly give a description of the Hospital. Originally it consisted of one building, four stories high, divided into twelve wards; and these again were sub-divided into the medical, surgical, and fever departments. Epidemics of fever, and the increasing demand for accommodation from an ever-increasing population, caused the managers to erect another four-storey building, and which is still popularly known as the Fever Hospital. In the year 1860, the managers, again finding their accommodation too limited, erected another four-storey building for the reception of surgical patients only. These three buildings or Hospitals constitute the Royal Infirmary and

can accommodate altogether 580 patients. The plan of the whole is what, with some modification as to height, internal arrangement, and distance from each other, I would recommend to be followed in the erection of a large General Hospital. One house is devoted to medical patients only, another to accidents, and the third (with the exception of two wards) is used entirely for chronic surgical cases. There are also wards for burns, for erysipelas, pyæmia, or other septic diseases; and when such cases are developed in the general wards they are at once removed to those places provided for them. The amount of cubic space available to each patient is, in the accident wards, from 1000 to 1500 cubic feet; whilst in the chronic surgical and medical wards, it is from 900 to 1000 cubic feet. The heating is by means of open fire-places, and there is cross ventilation. With this brief preparatory description of our Hospital, I now return to a review of the amputations which from time to time have been performed in it.

During the twenty-five years under consideration the number of amputations amounted to 1412. These consisted of amputations at the shoulder-joint, arm, fore-arm, hip, thigh, leg, ankle-joint, foot, elbow-joint, knee-joint, and multiple amputations—such as amputations of the thigh and leg at the same time on one patient, amputation of the shoulder-joint and thigh, of both legs, &c. Of the 1412, there recovered 960 or 67·9 per cent.; whilst 452 died or 32·1 per cent. This is a decrease in the mortality of 4 per cent., as compared with the rate given by Dr Lawrie, and of 10 per cent. from that given by Dr Steele.

Of the 1412, there were 1160 males, and of these 388 died or 33·4 per cent.; and 252 were females, of whom 64 died or 25·4 per cent. The rate of mortality given by Dr Lawrie was:—Males, 39·8 per cent.; females, 23·3 per cent. So that the mortality amongst the males has decreased 6 per cent., but increased 2 per cent. amongst the females.

The general result is on the whole satisfactory, and serves to show that the opinion advanced by Sir Jas. Simpson and others that the "mortality after amputation in Hospitals in-

creases with the age of the Hospital," should not be implicitly accepted without further investigation. I shall be able to show, further on, that even a new Hospital does not enjoy an immunity from the risks attending amputations.

Classifying amputation into the three usual divisions of primary and secondary after injury, and amputations for disease, I proceed to specify under each of these headings the nature of the amputation, the total number of each, the number who died, and the mortality per cent.

Primary Amputations after Injury.—Of the 1412 amputations, 657 were primary; and of these 240 died, a mortality of 36·5 per cent. against 50 per cent. as given by Dr Lawrie, and 36·6 per cent. as given by Dr Steele. Nothing shows more strongly the vast increase in the population, and the activity as well as the dangerous nature of the industries in and around Glasgow, than a comparison of the number of primary amputations as given by Drs Lawrie, Steele, and myself. For forty-four years Dr Lawrie gives the number of primary amputations as 78, or 1·77 annually; for ten years Dr Steele records 169, or 16·90 annually; whilst during the last twenty-five years there were 657 primary amputations, or 26·28 annually.

Nature of Amputation.	LAWRIE.			STEELE.			THOMAS.		
	Total.	Died.	Mor. per cent.	Total.	Died.	Mor. per cent.	Total.	Died.	Mor. per cent.
At Shoulder-Joint,	3	2	66·6	...	...	...	61	24	39·3
Arm, ...	23	11	47·8	49	15	30·6	134	45	33·5
Fore-Arm, ...	15	...	...	35	4	11·4	112	13	11·6
Hip, ...	1	...	...	...	...	...	7	6	85·7
Thigh, ...	12	11	91·6	32	21	65·6	118	63	52·5
Leg, ...	22	15	68·1	53	22	41·5	109	49	44·9
Ankle-Joint, ...	...	...	...	...	...	...	29	8	27·5
Foot, partial, ...	2	...	...	...	...	...	40	8	20·0
Elbow-Joint, ...	...	...	...	...	...	...	6	3	50·0
Knee-Joint, ...	...	...	...	...	...	...	15	6	40·0
Multiple, ...	...	...	...	...	...	...	26	16	57·6
Total, ...	78	39	50	169	62	36·6	657	240	36·5

Although unable to show such successful results as Dr Lawrie does in amputation of the fore-arm, hip, and foot, yet in all the other corresponding amputations there is a very great decrease in the mortality. For the shoulder-joint it is reduced

from 66 to 39 per cent.; arm, from 47 to 33 per cent.; thigh, from 91 to 52 per cent.; and leg, from 68 to 44 per cent. On the other hand, it will be observed that in the table of Dr Steele the mortality of amputations of the arm, fore-arm, and leg is lower than the corresponding amputations in the table which I give, but it is higher by 13 per cent. in amputations of the thigh. Neither Dr Lawrie nor Dr Steele have given a multiple sub-division; but I found it necessary to add it, as under this term are included double amputations in the same person of the most grave character, such as amputations of the thigh and leg, thigh and ankle, both legs, leg and fore-arm, leg and foot, shoulder and thigh, with others of a like character, and therefore requiring to have their results recorded. But excluding these, and taking only the four major amputations, the general result is still favourable to our period, as shown in the following table:—

Nature of Amputation.	LAWRIE.			STEELE.			THOMAS.		
	Total.	Died.	Mor. per cent.	Total.	Died.	Mor. per cent.	Total.	Died.	Mor. per cent.
Arm,	23	11	47·8	49	15	30·6	134	45	33·5
Fore-arm,	15	...	...	35	4	11·4	112	13	11·6
Thigh,	12	11	91·6	32	21	65·6	118	63	52·5
Leg,	22	15	68·1	53	22	41·5	109	49	44·9
Total,	72	37	51·3	169	62	36·6	473	170	35·8

From the above it will be seen with satisfaction that the mortality as given in the last column of the table is nearly 1 per cent. less than that given by Dr Steele, and 16 per cent. less than reported by Dr Lawrie. It is also lower than the mortality which Mr Erichsen, in his lectures on Hospitalism, mentions as occurring after primary amputations in four large Metropolitan Hospitals—viz., 48·6 per cent. In his own practice in University College Hospital, the mortality after the four primary major operations was 33·3 per cent., and 36 per cent. after the total primary amputations performed by him during a period of three years and five months. Mr Lane, of St Mary's Hospital, London, has collected from different sources 1683 primary amputations, and which show a mortality of 30·3 per cent.

Secondary Amputations after Injury.—Of the total 1412 cases, 172 were secondary; of these 89 died, a mortality of 51·7 per cent., or rather more than one half of the 172.

Under this division the mortality given by Dr Steele is 66 per cent., and by Dr Lawrie 56·5 per cent. Mr Erichsen, in the lectures already referred to, gives 59·5 per cent. as the mortality after secondary amputation in four large metropolitan Hospitals; whilst in his own practice in University College Hospital it was only 36·3 per cent. He acknowledges, however, that his numbers are far too limited to be taken as a standard for comparison, he having had only 11 cases in the course of $3\frac{1}{2}$ years. The following table presents an abstract of all the secondary amputations performed in the Glasgow Royal Infirmary as recorded by Drs Lawrie, Steele, and myself:—

Nature of Amputation.	LAWRIE.			STEELE.			THOMAS.		
	Total.	Died.	Mortality per cent.	Total.	Died.	Mortality per cent.	Total.	Died.	Mortality per cent.
Shoulder-Joint, ...	1	...	...	...	...	...	15	7	46·6
Arm, ...	13	7	53·8	16	9	56·2	22	7	31·8
Fore-Arm, ...	3	...	...	3	...	...	21	6	28·9
Thigh, ...	24	16	66·6	18	5	27·8	42	32	76·1
Leg, ...	5	3	60·0	19	13	68·4	50	29	58·0
Ankle-Joint, ...	...	...	...	...	...	...	1	...	...
Foot, partial, ...	...	...	...	...	...	...	17	1	5·9
Knee-Joint, ...	...	...	...	...	...	...	3	3	100·0
Both Legs, ...	...	...	...	...	...	...	1	1	100·0
Total, ...	46	26	56·5	56	37	66·0	172	89	51·7

The number of amputations which I give in the last table is nearly four times as great as the number given by Dr Lawrie, and fully three times the number recorded by Dr Steele; yet notwithstanding this, the mortality is less. The table also shows the increase and decrease in the mortality after each of the four major amputations. For the arm, the reduction is 22 to 25 per cent.; the only increase being 10 per cent. in the thigh, as compared with the record of Dr Lawrie; but it is 7 per cent. less than that given by Dr Steele. Each of them likewise records 3 amputations of the fore-arm, and all successful. Mr Lane in his paper on amputation in Cooper's

Surgical Dictionary, enumerates 1219 secondary amputations with 566 deaths, or a mortality of 46·4 per cent.

Amputations for Disease.—Of the 1412 cases, 583 were for disease; and of these 123 died, or 21·9 per cent. The percentage given by Dr Lawrie was 22·9, and by Dr Steele 39·9. Out of 44 amputations for disease, Mr Erichsen had a mortality of 18·1 per cent.; and under this heading he gives the mortality in the four metropolitan Hospitals as 27·4 per cent. Sir James Simpson, in his paper on Hospitalism, makes out, from the records which he had, the mortality of this Hospital to be at that time 33·8 after the four major amputations; whilst the statistics now given show the mortality after these to be only 26 per cent., that is 12 per cent. less than formerly recorded by Dr Steele. Mr Lane, in the paper before referred to, has collected the statistics of 1439 amputations for disease, with 376 deaths, or a mortality of 26·12 per cent. We stand, therefore, at the present time very favourably as compared with the other recorded statistics of the Infirmary, and also as compared with the statistics of other Hospitals.

The following table shows, as before, the individual and comparative results:—

Nature of Amputation.	LAWRIE.			STEELE.			THOMAS.		
	Total.	Died.	Mortality per cent.	Total.	Died.	Mortality per cent.	Total.	Died.	Mortality per cent.
Shoulder-Joint, ...	2	1	50·0	...	...	...	3	1	33·3
Arm, ...	17	3	17·6	9	5	55·5	30	5	16·6
Fore-Arm, ...	4	...	...	5	2	40·0	21	1	4·7
Hip-Joint, ...	...	...	...	...	...	...	6	4	66·6
Thigh, ...	92	19	20·6	22	7	31·8	204	63	30·8
Leg, ...	35	12	34·2	23	9	39·1	83	19	22·9
Ankle-Joint, ...	...	...	...	...	...	...	174	19	10·9
Foot, partial, ...	3	...	...	...	...	...	38	3	7·9
Knee-Joint, ...	...	...	...	...	...	...	24	8	33·3
Total, ...	153	35	22·9	59	23	38·9	583	173	21·9

Perhaps the most striking thing in the foregoing table is the small mortality attending amputation of the fore-arm. This stands first, as the safest of all the major amputations, and next to it in point of success is the late Mr Syme's method of amputation at the ankle-joint.

If the whole of the amputations given by Drs Lawrie, Steele, and myself are combined, the total number of amputations now recorded as having been performed in the Glasgow Royal Infirmary, from its opening to the 31st Dec., 1873, is 1973; of these 674 died, a mortality of 34·1 per cent. Mr Lane gives the statistics of 5242 amputations; of these 1744 died, or 33·25 per cent.—nearly one per cent. less than the mortality of our whole recorded amputations. Of the 1973 cases, 904 were primary, 274 secondary, and 795 were amputations for disease. Of the 904 primary, 341 died, or 37·7 per cent.; of the 274 secondary, 152 died, or 55·4 per cent.; whilst of the 795 amputations for disease, 181 died, a mortality of 22·7 per cent. In Mr Lane's collection of statistics, the average mortality is as follows:—Primary, 30·3 per cent.; secondary, 46·43 per cent.; for disease, 26·12 per cent.

The following table shows the total number of the four major amputations from the opening of the Hospital in 1794 to 31st Dec., 1873:—

Nature of Amputation.	PRIMARY.			SECONDARY.			DISEASE.			TOTAL.		
	Total	Died	Mor. p. cent	Total	Died	Mor. p. cent	Total	Died	Mor. p. cent	Total	Died	Mor. p. cent
Arm, ...	206	71	34·4	51	23	45·0	56	13	23·2	313	107	34·1
Fore-Arm,	162	17	10·4	27	6	22·2	36	3	10·0	219	26	11·8
Thigh, ...	163	95	58·2	81	63	75·0	318	89	27·9	565	247	43·7
Leg, ...	184	116	63·0	74	45	60·8	141	40	28·3	399	201	50·3
Total,	715	299	41·8	236	137	58·0	545	145	26·6	1496	581	38·8

Combining together the primary and secondary amputations in the preceding table, we get a total of 951, with 346 deaths, or 45·8 per cent., whilst for disease alone it is 26·6 per cent.; total 38·8 per cent.

I will quote, from Sir James Simpson's paper, the statistics which he gives of the four major amputations in several large Hospitals, which, from the number of beds they contain, can alone be fitly compared with the Royal Infirmary:—

I.—*Edinburgh Royal Infirmary*, 519 beds—

Mortality, after amputations, for injury, 51·3 per cent.

“ “ “ disease, 35·6 “

“ “ all amputations, - - 43·3 “

II.—*St Bartholomew's Hospital, London, 650 beds—*

Mortality, after amputations, for injury,	40.0	per cent.
“ “ “ disease,	34.4	“
“ “ all amputations, - -	36.6	“

III.—*London Hospital, 560 beds—*

Mortality, after amputations, for injury,	58.8	per cent.
“ “ “ disease,	33.0	“
Total, - - - -	47.3	“

IV.—*Guy's Hospital, London, 580 beds—*

Mortality, after amputations, for injury,	49.0	per cent.
“ “ “ disease,	28.0	“
Total, - - - -	38.2	“

From this it will be seen that, so far as the total mortality is concerned, the Glasgow Infirmary ranks third on the list; the oldest Hospital in London (St Bartholomew's) being the healthiest; but analyzing the returns, we find the Royal Infirmary stands second as to amputations for injury; but first, in point of success as to amputations for disease.

I have just mentioned that St Bartholomew's, the oldest Hospital in London, was the healthiest of all the large Hospitals; and this recalls to me the statement I formerly made, viz., that implicit reliance should not be placed on the opinion expressed by Sir James Simpson, and other high authorities, that the risks after amputation increased with the age of an Hospital. Having the opportunity, I resolved to test this opinion. On the 21st May, 1861, the present Surgical Hospital was opened for the first time, for the reception of patients suffering from injuries. In preparing these statistics I was surprised to find that not only the first case of amputation, but also the second and third performed within its walls, died of pyæmia. Instituting, therefore, a comparison between the old and the new Hospitals, I prepared a list of the amputations in the old wards, from 1st January, 1849, to 21st May, 1861, and of those amputated in the new Hospital from the latter date to 31st December, 1873. In the first period, and in the old wards, 182 primary amputations were performed, with a mortality of 32.4 per cent.; whilst in the new Hospital the number of primary amputations was 404, with a mortality of 38.3 per cent. Con-

tinuing the investigation, I collected the secondary amputations, but with a different result; for whilst the mortality in the old Hospital was 60, in the new it was only 42 per cent. The totals in each building were—

Old Hospital, 277 cases, 116 deaths, or 41·8 per cent.

New “ 461 “ 179 “ or 38·8 “

a difference of exactly 3 per cent. in favour of the latter, but not sufficiently great in my estimation as to cause the decrease to be attributed solely to the newness of the Hospital.

I now proceed to notice the causes of death, as without these the record would be incomplete, and barren of any good result. Putting aside, however, all such causes as tetanus, internal injuries or diseases, phthisis, and all cases of useless interference, (and by this latter cause I mean amputation where the patient died either on the operating table, or immediately after being removed from it) I will confine myself to noticing only such causes as shock and pyæmia; the first, because it shows the severe nature of the injury for which amputation was performed; the second, because it is the great agent in increasing the rate of mortality. Out of 240 deaths, occurring after primary amputations, 42 were ascribed to shock; *i.e.*, nearly 1 in every 6 who died were hopeless from the first. Passing on to the consideration of pyæmia as a cause of death, I may here say, to prevent misconception, that it is to pyæmia occurring after amputations in the Hospital, and not to any cases imported from without, that my remarks have reference. Out of the 240 primary deaths, no less than 54 are ascribed to it; giving us a mortality of 22·5 per cent. of the deaths, and 8·2 of the total primary amputations. Out of the 89 secondary deaths, 27 died from it—a still larger mortality; as it is 30 per cent. of the deaths, and 15·7 of the total secondary amputations. In the vast number of these cases, pyæmia had set in, or at least signs had occurred previous to the operation; so that where this has occurred, secondary operations should not be saddled with them. I have universally found, that where a rigor has set in, all attempts to save the life of the patient by operation have universally failed. Of the 123 deaths after amputation for disease, 26 were pyæmic, or 21 per cent., or 4·4

per cent. of the total 583 amputations for disease. Of the total 451 deaths occurring out of 1412 amputations, 107 died from pyæmia, or 7·5 per cent. of the total amputations, and 23 per cent. of the total deaths; or to put it more strongly, one out of every four who died might have survived had it not been for this pest; and instead of having a mortality of 32 per cent. to record, but for this cause, the total mortality would only have been 24 per cent.; that is, 8 persons out of every 100 operated on would have been saved. In his paper, Dr Lawrie gives the mortality from it as 1 in every 3·4; and Dr Steele, as 1 in every 3 of those who died. Whilst, therefore, we seem to have rather improved, still these facts show that it is still bad enough, and that it demands the earnest attention of all Hospital surgeons to do something that will exterminate this plague, or at least mitigate its ravages, so that the minimum of danger from this, as from all other supposed preventible causes, may be arrived at.

I will now make a comparison, to see how the Royal Infirmary stands as regards pyæmia with other Hospitals; and for this purpose will take the latest, and I have no doubt the most accurate statistics yet published—I mean those given by Mr Erichsen in his book on Hospitalism. In four Metropolitan Hospitals, numbering amongst them nearly 2000 beds, the mortality from pyæmia, in the primary deaths alone, was 33·3 per cent.; in the secondary deaths it was 44·4 per cent.; and in the deaths after amputation for disease it was 37·7 per cent. Out of a total of 239 deaths, 86 were from pyæmia, or 35·9 per cent.; or 13·6 per cent. out of a total of 631 amputations. As mentioned previously, the mortality in the Glasgow Infirmary was 7·5 of the total amputations. Dr Chadwick, in the report of the Massachusetts General Hospital, returns 42 deaths from pyæmia, out of the 180 fatal cases that occurred after amputations of all kinds, being in the proportion of 23·3 per cent. of the deaths, and only of 5·7 per cent. of the whole number of amputations: a very low per centage of septic mortality. In Mr Erichsen's own practice in University College Hospital, pyæmia caused 13·5 per cent. of the deaths, or 10 per cent. of the whole 80 cases which he gives. Mr Callender, of St Bartholomew's,

gives 1 death out of 35 consecutive amputations, performed by Sir James Paget and himself, in the course of four-and-a-half years, but does not state the cause of death. It may be remarked, in passing, that this gives to each of these distinguished surgeons only four amputations per annum. Single instances of success, such as the above, could be further recorded. A former surgeon of the Infirmary had 18 amputations of the thigh, with only 1 death; but this is excelled by Carden, who had 17 similar consecutive amputations without a death. Dr Macleod, at a meeting of the British Medical Association, reported that he had 33 Syme's amputations, with only 1 death; but what is perhaps of more value, I find that in the years 1871, '72, and '73, we had 69 amputations at the ankle-joint, with only 1 death.

Before closing this paper, I may here ask, whether pyæmia is preventible or not? I believe that, to a large extent at least, it is preventible. We are still ignorant of what really causes it; but if it be from germs or bacteria, as Mr Lister alleges, and the researches of Dr Burdon Sanderson almost prove, there can be no doubt that the antiseptic treatment of amputations is the proper one. For the sake of elucidating this under the most favourable conditions, it is almost to be regretted that Mr Lister was transferred to Edinburgh; as the opportunities he had here for putting the antiseptic treatment into practice were much greater than in the Hospital he is now connected with. But notwithstanding this, the profession generally, and Hospital surgeons in particular, look forward with interest to the general results of his experience when he is pleased to publish them. Besides the antiseptic treatment, the whole of our knowledge as to prevention may be summed up in two words—cleanliness and ventilation. Mr Erichsen, to whom I have so often referred, gives very clear and definite hygienic rules; and as an addition to them I would venture to suggest the employment of a special nurse, to establish a more effectual and complete separation from the other inmates of the ward. I would also suggest the erection of a number of large airy rooms separate from the wards, into which patients who have undergone operation could be put; and one great advantage of this suggestion is, that after each patient was dismissed, the room could be cleaned with the greatest ease, and

without disturbing other patients, or injuring the usefulness of the Hospital.

Into the vexed question as to whether pyæmia is more prevalent in large than in small Hospitals I will not enter, or hitherto we have had no means of instituting a proper comparison. The only way to do so thoroughly would be to establish in such a city as Glasgow a number of small Hospitals, into all of which the patients who would be admitted would be of the same class and under the same conditions. The Hospitals of Paisley, Greenock, Dundee, or Belfast, might be compared as small Hospitals with that of Glasgow, placed as they are in the midst of a population very much like our own, and in the case of Dundee the comparison is ready to hand—for extracting the numbers from Sir James Simpson's tables, I find that out of 67 amputations for injury of the thigh, leg, arm, and fore-arm, 24 died, or 35·8 per cent.; whilst for disease the number of amputations he gives is 14, with 8 deaths, or 57·1 per cent.; and combined, the mortality is 39·5 per cent., against 38·8 of the Glasgow Infirmary. But the causes of death are not stated for the purpose of comparison, as to the amount of pyæmia in each; for there can be no doubt that the true test of the healthiness or otherwise of all Hospitals is the presence or absence of septic disease. It will be interesting by and by to compare the results obtained in our new Western Infirmary with those in the old; and, as I have no doubt, the surgeons of the Western Hospital will keep a record of their operations, similar in all respects to what they have hitherto been accustomed, the comparison will be easily made, to the benefit no doubt of the patients in both institutions.

VII.—NURSING: AN ACCOUNT OF THE DRESDEN NURSING ASSOCIATION. ALBERT VEREIN.

By WILLIAM J. FLEMING, M.B., F.F.P.S., Surgeon to the Dispensary of the Western Infirmary, Glasgow.

DURING a recent residence in Dresden, the serious illness of a friend gave me the opportunity of becoming intimately

acquainted with the system of nursing the sick which obtains there.

At present the subject is attracting so much attention here, that an account of the Dresden Nursing Association may be of interest.

It is called the Albert Verein, and owes its origin chiefly to the two serious wars in which Prussia has within a short period been engaged. Peace, however, instead of dissolving has given it a more stable foundation, as it is evident that much good can at all times be done by such an institution; and that to be really efficient in time of war its machinery must be complete and working in time of peace. The Queen of Saxony is the patroness, and takes a most cordial and constant interest in it. In fact, she is the moving spirit of the whole, and devotes to it an amount of time, care, and attention, worthy of the highest praise and emulation.

The general purpose of the institution as set forth in the rules for nurses (*Phlegerinnen Ordnung*) from which chiefly the following information has been extracted, is to train nurses for the purposes of the Verein, and to provide for them full opportunities of practical and theoretical instruction. They admit "any woman of good character between 20 and 40, with the usual amount of education," and I need not say that this implies more in Germany than here. However, it will be seen from the rate of remuneration mentioned afterwards, that even considering the smaller price of labour in Germany, it is not intended to be a lucrative employment, but rather one for women who have a vocation towards nursing, and who, many of them at least, are not altogether dependent upon their employment for support. In accordance with this, although subjected to strict discipline, they are never treated as in the least degree menial. But here again our different ideas show themselves, as of course no German lady considers household duties menial. The nurses are divided into two great classes which we may distinguish as paid and unpaid, regular or occasional. The exact distinction will be given further on. An

applicant for admission, having furnished certain information, is admitted a probationer, and has to sign an agreement—to obey the rules of the association—to serve for three years—to pass the required examinations, and if she breaks this agreement or is dismissed, to repay all the pocket-money she has received. Those who enter as unpaid or freewill nurses have to sign a contract binding them to attend to the rules, and, after being instructed, to remain at the service of the association in case of war or epidemic. If they act for ten years they get a pension, but if they do not conform to the agreement, they have to pay back all they have cost the association. The course of probation extends over three years, and if a nurse finds during this time that she has no vocation for nursing, she may with the consent of the association withdraw.

After the three years' probation the rank of full nurse (Albert Vereiner) is attained, but before this, various test examinations have to be passed.

The Verein has an Asylum in Dresden, where nurses not employed live under the charge of a matron, and here the probationers are first received, and undergo if necessary a course of instruction in ordinary household duties, to which great importance is attached, and I believe rightly. After a short time they are sent to the Convalescent Home, near Dresden, where under the tutelage of Frau Simon, who distinguished herself much as a red cross nurse during the war, they receive further instruction, but even here their duties are more household than professional. They are then sent to Leipsic for a year, and undergo two courses during this time; the first six months, medical, the second, surgical, under regularly appointed teachers—physicians and surgeons connected with the Hospital. The subjects of instruction are:—

Accommodation, *i.e.*, the manner of housing the sick in and out of Hospital. Bedding. Nourishment of the very sick. Use of water beds, pillows, and other sick-room apparatus. Nursing children in the first years of their life. The difference of medicines as to form, administration, and

employment. Injections into the mouth, nose, ears, &c. Female catheter. Baths, including douching, packing, rubbing, &c. Subcutaneous injection, embrocations, cataplasms, sinapisms, blisters, leeches, and cupping. Taking temperatures and pulses. Compression of arteries. Observation of the sick as to temperature, pulse, mental condition, colour and moisture of skin, thirst, &c., so as to be able to report correctly to the doctor in attendance. The preparation and application of all kinds of bandages. Three or four cornered handkerchiefs. Head ice bags. Charpie, plaited and combed. Wadded pads, &c. Use of waterproof materials, chaff and straw pillows, axillary pads, pasteboard splints and their padding. Preparation of rigid bandages of Plaster-of-Paris, Starch, Silicate of Potash, (water glass) &c. Preparation of the different dressings for wounds. Preparation of the different amputation bandages. Assisting in dressing wounds and at operations. Names and uses of ordinary surgical instruments and appliances.

After undergoing the above course, they become fully installed nurses (Albert Vereiners), and as such have to obey the Directorate; nurse any sick person—rich or poor—in private or in Hospital to whom they are sent by the Verein; and, in doing so, must give absolute obedience to the doctor. If in a place where the Verein has an asylum, the nurse may live either in it or not as she chooses; but must always keep the society informed of her address. She is liable to be dismissed for bad nursing. The society, however, will support her against unfair claims, or want of proper attention. The nurses are paid for the first six months free board, and for the second, 9s pocket money and 3s clothing money, monthly. From end of first year, a gradual rise to 12s pocket money and 6s clothing money up to end of third year; from this a rise to 24s pocket money, and 6s for clothing, all monthly. At the end of three years the probationer has a right to a pension if invalided.

The probationers must remain for three years; or if they leave, or are dismissed, must refund all the money received as pocket money during the theoretical course. After the

three years, when she is a full nurse, she can leave at a month's notice, receiving her payment up to the time of leaving. The freewill sisters, on the other hand, are entitled to a pension only after ten years continuous service. If the freewill nurse refuses to act when called upon, she must pay back what she has cost the Verein.

While residing in any of the asylums of the association, the nurse is subject to a strict code of rules. Her duties, her meals, her church attendance, her times of liberty and how she is to employ them, her visitors and when they are to be received, are all minutely laid down.

The dress of the nurses is fixed by the Directorate, and consists of a very neat plain white lawn cap, a grey dress, and a large waterproof cloak, the hood of which is drawn over the head when out of doors, no bonnet being worn. Stringent rules forbid the nurses to receive any present or gratuity from patients or their friends; if anything more than the usual charge is given, it must be sent to the Directorate, by whom a part will be given to the nurse, and another part to the pension fund. In private nursing, the nurse must not rank with the servants of the house, but must have her meals alone, or with the family. At first, a nurse is on duty 48 hours, but if the sickness is likely to be of long continuance, two nurses must be employed, and then they take 24 hours each. The nurse is not at liberty to choose where she will go to nurse, but must be sent by the Directorate. Complaints are to be sent to the Directorate, and objections by the nurse must be made through the same source. Prominent merit is recognised and acknowledged by presents and indulgence: demerit subjects the nurse to reprimand, and if persisted in, ultimate expulsion. Full nurses during sickness are treated and taken care of by the society, and if they have been ten years in the service and become unfit for their vocation, they are assisted from the pension fund.

Any person can procure a nurse on 24 hours' notice, and the rate of payment is from three shillings to four and sixpence a day. The society also nurses poor people, either

gratuitously, or at a reduced rate, if the Directorate considers the case a suitable one for such charity. Hospitals and public institutions are arranged with by special contract.

Such are the leading rules of this most excellent institution, and with the necessary modifications it appears to me they might be introduced here with special advantage. Our great difficulty, I know, is to get the proper class of women in sufficient numbers; but I feel assured that it is the want of a proper opening for entering the profession of nursing, and an ignorant dread of imaginary horrors, which holds back many suitable people from embracing the occupation. The sort of women wanted, is what may be roughly called the nursery governess class—the very women who are crying out against the narrow and crowded career which exists for them. With their education and feelings they cannot enter domestic service, nor do they like, even if there was room for them all, to enter the telegraph or other services lately thrown open to them. Nursing seems to meet their case. Surely nothing could be higher—more refined in the true sense of the word, more womanly—than tending the sick; and it is no longer a business set aside for the old and incapable. As now understood, and as a glance at the course of study given above will show, it is sufficient to engage the mind of the most intelligent and persevering. Nor is it without its reward. The world is beginning to learn that in this, as in all other things, superior skill and knowledge must be fitly paid; and now we often see advertised matronships and nursing posts with salaries really remunerative. These, of course, are the prizes in the race; but they are surely enough to tempt superior women to undertake the profession, and even if they never attain to them, they will always have the consolation of knowing that they have done good work in their generation.

Here, some such institution seems much wanted, and indeed attempts have been made to provide it, but with scant success. This cannot be from want of a proper field, as nowhere are there greater opportunities. Our students

have access to nearly 1000 Hospital beds; and we feel sure nurses would also, under proper regulations, be admitted to most of the institutions which contain them.

Will none of our many philanthropists take up this very needful work? I am sure they will receive cordial assistance from the members of our profession. The sort of scheme I would suggest, founded on the Albert Verein system, would be one or more asylums in the immediate neighbourhood of the Hospitals, superintended by a matron, not necessarily a trained nurse, and managed by a small committee of ladies. Here the applicants would be first placed, and should receive, if necessary, careful instruction in housewifely duties, especially cookery. From this let them advance more or less completely to Hospital attendance; at the same time attending theoretical lectures. These lectures might also be thrown open to ladies desirous of learning nursing, and by this means would, to some extent, be self-supporting. Having completed thus a course of, I would suggest, two years, and passed one or more examinations, the society would give a certificate of competency, which would soon become of great value, and, in fact, would almost certainly lead to a good appointment. Previous to admission a preliminary examination would be valuable, and as a rule I think it would be better if the nurses, however occupied at the Hospital, resided in the Home. If this were near enough to the Hospital it would entail no difficulty. Some, I know, will dread the working of such a system with the two authorities of the Hospital and Society, and will point to the recent events in King's College Hospital as confirmatory of this fear. But these unfortunate differences seem to show, chiefly, how easily they might have been avoided; and the failure of the system, in one instance, does not prove that it will not succeed, especially when we remember that the dispute in question arose almost entirely from the personal disagreement of one or two people, and from a combination of circumstances of a nature so unusual that their recurrence is extremely improbable.

All I think will admit the advantages of such an institution; but it must not be a charity. Every effort should be made to make it self-supporting, and I feel sure this could be managed, after the first few years.

The nurses must understand clearly that they are serving an apprenticeship. That in consideration of free instruction, and opportunities of practice, with board, lodging, and clothing, and perhaps a small sum as pocket money, they must give their services for a certain time (say three years from entrance) to the society, and that at the end of that time they will be in a position honourably to support themselves. That such will be the case, the great demand for trained nurses shows, and this demand is rapidly increasing, as people are beginning to learn that nurses are made, not born; that no one, however loving and willing, can by intuition know the technicalities of the profession. Many people will be rather shocked at the truth which doctors are now almost all agreed upon, that in serious illness, the patients' nearest and dearest are the most dangerous attendants they can have. Not only as a rule are they absolutely ignorant of what may be called the technicalities of nursing, but their anxiety deprives them of that calmness of mind so necessary for the accurate carrying out of instructions, and without which a deliberate judgment of the condition of matters is impossible. I would not propose that the society as such should in any way undertake charitable nursing, but I would have it ever ready to supply nurses on the cheapest terms to any other association having this for its object.

VIII.—DESCRIPTION OF A CASE OF DEFECTIVE CORPUS CALLOSUM.

By D. N. KNOX, M.A., M.B., *Demonstrator of Anatomy in the University of Glasgow.*

(*Read before the Pathological and Clinical Society of Glasgow,*
9th March, 1874.)

THIS rare defect was found in the brain of a female idiot who had been an inmate of the Town's Hospital, Glasgow, for many years. The following particulars as to her bodily and mental condition during life have been supplied by Dr Alexr. Robertson, superintendent of the Hospital:—

"This patient was a woman, age above 40 at death.

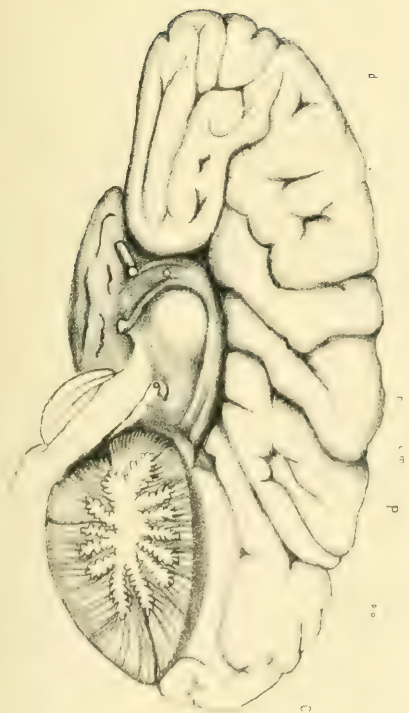
The idiocy was of a low type. She could not articulate, but often screamed loudly without apparent cause. Hearing, vision, and general sensation were all present; but how far defective could not be determined. She was of dirty habits, in respect both of bladder and bowels. Menstruation was regular for many years. There was no paralysis, and her muscular development was good. There was slight ordinary club-foot. Though she could walk, she seldom did so; her favourite position being on her back rolling on the ground, and owing to that she was nearly bald on the back of the head. She never showed any recognition of any one, not even of the attendant who had charge of her for many years. Her head was of average size, but misshapen, the occiput being very flat and the brow very low. The features were very coarse, but her hands were small and well-formed."

The brain weighed $36\frac{1}{2}$ oz. It had, however, been 10 days in spirits, and the membranes had been removed from one hemisphere. It measured in extreme length $6\frac{7}{8}$ in. Breadth of each hemisphere was $2\frac{1}{8}$ in., depth about $3\frac{1}{8}$ in. The two hemispheres were nearly symmetrical. On being placed on its base after removal of the membranes, the hemispheres fell outwards, and showed at once the parts in the floor of the lateral ventricles, there being no appearance of corpus callosum or fornix. A vertical section in the median plane having been carefully made, the interior of the ventricles was examined. Generally speaking, these cavities were rather small; the length of the third ventricle as measured from the anterior to the posterior commissure was $1\frac{1}{8}$ in., that of the lateral ventricles was $4\frac{3}{4}$ in. The posterior horns of these ventricles were considerably dilated, and their lining membrane thickened.

The corpus callosum appeared to be wholly wanting, or only represented by a very slight ridge, which anteriorly was

DESCRIPTION OF PLATE.

Right half of brain of idiot, with defective corpus callosum. *P*, præcuneus; *C*, cuneus; *x*, fissure of Rolando; *c m*, calloso-marginal fissure; *p o*, parieto-occipital fissure; *e*, calcarine fissure; *d*, fissure formed by folding down of marginal convolution.



CASE OF DEFECTIVE CORPUS CALLOSUM

$\frac{2}{3}$ NAT SIZE

scarcely perceptible, but posteriorly was about 1-10th of an inch in depth. It began in front above the lamina cinerea and passed upwards and backwards attached to the side of the general cavity of the ventricle, forming the upper border of a layer of white matter, the lower border of which was part of the fornix. About half-way back it became separated from the fornix, and at last ran into the anterior and lower part of the hippocampal convolution. The lamina cinerea was divided superiorly so as to appear like a small ridge running up in front of the anterior commissure. The fornix was completely divided in the middle line. Its anterior pillars could be traced to the corpora albicantia. Each lateral half ran upwards and backwards as a sharp well-defined border, and might be traced into the descending cornu of the lateral ventricle, where it ended in the usual manner. Extending between the anterior part of fornix and the ridge described above as corpus callosum, was a lamina of white matter of considerable thickness, apparently having no attachment to corpus striatum, but bounding on the inside the entrance to the anterior horn. This was taken to represent one-half of the septum lucidum, carried away from the middle line by the divided fornix and corpus callosum. The fifth ventricle was thus opened up, and communicated with the general ventricular cavity. Into this opened fifth ventricle the convolutions immediately above, and which formed part of the lateral ventricles, dipped down. The anterior and posterior commissures of the third ventricle were present and well marked. There was no means, however, of saying at the time of examination from the appearance of the parts, whether the soft commissure may have been present or not. The thalamus was $1\frac{1}{2}$ inches in length; its anterior superior tubercle was very prominent.

On the outer surface of the brain the convolutions were numerous, but rather small. Some of them appeared depressed, as it in the course of their development they had not been able to reach the surface. The principal fissures and lobes are distinctly marked; the secondary fissures were very shallow and in many places very straight, and looked

almost like slight cuts with a knife. The Sylvian fissure was well marked. The Island of Reil seemed normal. The fissure of Rolando was also normal. The ascending convolutions were also normal, but thin. The termination of the callosomarginal fissure came out very far on the outer surface, and was very close behind the fissure of Rolando. The interparietal fissure was difficult to follow, as it was broken up by secondary convolutions bridging over it from the median side. In other respects the fissures and convolutions of the outer surface were normal. On the median aspect the gyrus fornicatus was wholly wanting, and only that part of the callosomarginal fissure which passed up in front of the præcuneus or quadrate lobe was present. Both the præcuneus and cuneus reached to the back part of the ventricular cavity, and both the parieto-occipital fissure and the calcarine fissure, between which the cuneus lies, passed separately down into the ventricular cavity, instead of uniting and passing downwards behind the ventricular cavity altogether, towards the hippocampal convolution. This unusual termination was evidently due to the absence of the gyrus fornicatus, which, in the normal brain, separates these fissures and their neighbouring parts from the ventricular cavity. To the same cause was due the presence of the fissure marked *d* in the plate, which was not found in the normal brain, but was here caused by the folding down of the marginal convolution, to fill up, so to speak, the space of the gyrus fornicatus. It may be looked upon as a portion of the callosomarginal fissure which had not been unfolded from the defect of development. To the same defect we must attribute the great flattening of the upper surface of the anterior and superior lobes of the cerebrum, which gave the markedly flat character to the frontal bones noted by Dr Robertson during life.

For the sake of comparison, and with a view to determine, if possible, how far the mental defect was due to the visible brain defect, I have collected together all the cases I could find, in which a similar lesion existed, and in which the mental condition has been recorded.

I. REIL—Archiv f. Phys., 1812, p. 341—A woman, age 30, otherwise healthy, but of weak intellect, who yet could carry messages from the village where she dwelt to the neighbouring town, suddenly fell down and died apoplectic. On section there was found, moderate dropsy of the ventricles; absence of the corpus callosum, middle and posterior commissures, lamina cinerea, and gyrus fornicatus; and division of the fornix into two lateral halves. The two hemispheres were merely held together by the optic and anterior commissures, the isthmus of the crura cerebri and by the corpora quadrigemina.

II. SOLLY—On the Human Brain, Lond., 1836, p. 433—A lad, aged 16, died from fracture of the skull. He was of weak intellect from his birth, very childish, or; to use his mother's expression, "boobyfied." He could read, and was especially fond of religious books. On inspection, besides the appearances resulting from the fracture, a membranous bag protruding from the left hemisphere was found to replace the corpus callosum, and to form the roof of the left lateral ventricle. The posterior pillar and part of the body of the fornix on the left side were also wanting. The soft commissure was very wide and thick. On the velum interpositum there was a small hydatid, and a considerable quantity of fluid in the ventricles.

III. CHATTO—Lond. Med. Gazette, 10th January, 1845—A child which died at 1 year. It had grown well, but had never shown any sign whatever of recognising persons or objects. Its death occurred from coma supervening on a series of convulsive fits. Inspection of head showed congestion of the meninges; dropsy of the ventricles; absence of the corpus callosum with the exception of some narrow strips a few lines in breadth, stretching between the anterior portions of the hemispheres; absence of the septum lucidum and fornix; a number of hydatids in the third ventricle, the largest about the size of a hazel nut; cerebral substance very firm, while the medulla oblongata and superior portion of the medulla spinalis cut just like a piece of cartilage.

IV. PAGET—Med. Chir. Trans., vol. 29, 1846—A female, aged 21, whose only mental peculiarities were vivacity, want of caution and forethought, very heedless, especially about her

dress, and rather uncleanly in her habits. She had a good and retentive memory, and performed her duties as a maid-servant in a dexterous manner. Her mother had become insane about two years before the birth of this girl, and her insanity was aggravated during pregnancy, so that she twice attempted to commit suicide. It was also aggravated during succeeding pregnancies. The girl died from pericarditis.

Inspection.—Corpus callosum was very rudimentary, consisting of the genu and several obliquely arranged fasciculi of the fibres of the body, and being altogether 1·4 inches in length from before backwards in the middle line. Septum lucidum was absent, and fornix was in two lateral halves. The soft commissure was present and very large, measuring 0·6 inch from before backwards. The other commissures were normal.

V. WARD—Lond. Med. Gazette, March 27, 1846—An illegitimate child who died at the age of 11 months from diarrhoea, attended with violent convulsions. It could see and hear, but gave no sign of intelligence, scarcely recognizing its nurse. It whined like a puppy.

Inspection.—Brain substance firm: anterior lobes very flat: the hemispheres were only held together by the commissure of the optic nerves, the other commissures being wanting, and even the tuber annulare splitting into two equal halves when the brain was laid on the table.

VI. MITCHELL HENRY—Med. Chir. Trans., vol. 31, 1848—A boy, aged 15, died of pleurisy. He was of ordinary intelligence, or nearly so, but very slow at learning or answering questions, exhibiting a sluggishness rather than an actual deficiency of mind. Health had always been good.

Inspection.—The central part of the anterior half of the corpus callosum was absent, the posterior half being normal. Septum lucidum, anterior and middle parts of the fornix also absent.

VII. GAUSTER—Wien. Zeitsch., XI., 5, 6, 1845. Schmidt, Jahrb., 1856, p. 96—A male who had become epileptic in his 20th year from a fright, and thereafter had become gradually idiotic. He died of tabes in his 26th year.

Inspection.—Corpus callosum entirely wanting, middle and posterior commissures also wanting.

VIII. FOERG—Die Bedeutung des Balk. im Menschl. Gehirn, Augsburg, 1855. Schmidt, Jahrb., 1857, p. 361—A female, aged 17, who was idiotic in the highest degree. Her head was large and misshapen, feet and legs were bent like sickles.

Inspection.—There was complete absence of the corpus callosum, of the body of the fornix, and of the middle and posterior commissures; septum lucidum was very rudimentary. Lateral ventricles dilated; gyrus fornicatus absent.

IX. LANGDON DOWN—Med. Chir. Trans., vol. 44, 1861—A boy, aged 9, an idiot who could not speak or remember, and could not be taught anything. He was the eldest of three children; the second, a boy, was also idiotic, while the third, a girl, was healthy and intelligent. Parents were healthy. Death occurred from pneumonia.

Inspection.—The corpus callosum was represented by a narrow band $\frac{1}{3}$ inch broad over the fore part of the third ventricle. The septum lucidum, body of fornix and fifth ventricle were absent, the soft commissure was also absent. The posterior cornua of the lateral ventricles were dilated. On the median aspect of the hemispheres the convolutions seem to have resembled those in Reil's case, in which the gyrus fornicatus was absent, the words of Reil's description being used so far by Dr Down.

X. LANGDON DOWN—Med. Chir. Trans., vol. 49, 1866—A man of 40 years, imbecile, had slight memory and could read a little. Body well formed, and general health good. Death was caused by pleuro-pneumonia.

Inspection.—Calvarium very flat anteriorly. Corpus callosum was almost entirely absent, the only rudiment of it being a narrow "cartilaginous-like band 7-24 inch in breadth, and 1-24 inch in thickness, situated opposite the corpora striata." Only the thin posterior pillars of the fornix were present. The soft commissure was absent; the right thalamus was much enlarged, and the pineal gland was the size of a cherry. The posterior cornua of the lateral ventricles were distended with serum.

XI. BIRCH-HIRSCHFELDT—Arch. f. Heilk., VIII., 6. p. 481, 1867, or Jahresbericht f. Med. I. p. 213—A male, aged 41, of

ordinary intelligence, and with special senses normal, except that there was external strabismus of right eye, of very long standing. Death from apoplexy.

Inspection.—The anterior half of corpus callosum was awanting. There was dropsy of the fifth ventricle, causing a wide separation of the laminae of the septum lucidum. A bag containing fluid, and which communicated with the cavity of the fifth ventricle, rested on the left frontal lobe of the brain, and had caused the destruction of a considerable portion of each of the three frontal convolutions. The rest of the brain was normal.

XII. NOBILING—Bayer. Artzl. Intelligenzbl., No. 24, also Jahresb. f. Med., 1869, p. 153—A man who had always enjoyed good health, and whose mental faculties were good, died of cancer of the stomach and perforation of its coats, at the age of 58. On inspection of the brain it was accidentally found that the corpus callosum was extremely short, being scarcely half its usual size, the posterior part being rudimentary, and only represented by a narrow oblique band on each side. The fornix was also rudimentary, the body being divided into two lateral halves. The ventricles were dilated, and their ependyma thickened. An exostosis, the size of a hazel nut, was found on the crista frontalis.

XIII. HUPPERT—Archiv. f. Heilk., Heft. 3. p. 243, 1871, Jahresb. f. Med., 1871, II. p. 23—An epileptic idiot in which the body and radiating fibres of the corpus callosum, the body of the fornix, and the septum lucidum were awanting. The other commissures were present. The middle one was even enlarged. The ventricles were markedly enlarged.

XIV. MALINVERNI—Giornal. del. R. Accad. di Torino. 1874, Gazette Med. de Paris, January 16th, 1875—A soldier, aged 40, died of a gastro-intestinal affection; he was of ordinary intelligence, and did his duty correctly, nothing was ever remarked about him except that he was somewhat deficient in habits of personal cleanliness, that he was inclined to melancholy and solitude, and was of a taciturn humour. This "*pouchant à la tristesse*" was not, however, so marked as to become a pathological state. Inspection showed the entire

absence of the corpus callosum, septum lucidum, and of the gyrus fornicatus.

In this list the sex has been noted in twelve cases, and of these, five were females and seven males. As regards age at death, three were under puberty, six were between fifteen and thirty years, and five were above the latter age. The cause of death in most of the cases had nothing to do with the brain defect. In two cases, however (those of Chatto and Ward), convulsions are given as the cause; but in Chatto's case, as Paget has already pointed out, the convulsions may fairly be accounted for by the presence of the large hydatid in the third ventricle; while in Ward's they were probably due to the same cause which produced the diarrhœa with which they were associated. In two cases only death occurred through apoplexy, due no doubt to the pressure of the dropsical fluid in the ventricles.

With reference to the ætiology of the brain defect, dropsy of the ventricles would seem to have been the most frequent, if not the sole cause. In nine cases fluid was found in the ventricular cavities, or the lateral ventricles, and especially their posterior horns were dilated, and their lining membrane thickened. In Solly's case a large cyst projected from the left lateral ventricle, and a hydatid was found on the velum interpositum. In Chatto's case also, a bunch of hydatids was found in the third ventricle in addition to the dropsy.

The family history is only mentioned in five cases. In two, insanity had appeared in other members of the family; in other two, the parents were "not of average intellectual power," and the fifth was an illegitimate child, the mother of which, though healthy, was, during her pregnancy, much distressed by the conduct of the father. In a third of the cases, therefore, the defective cerebral development was in some measure associated with a hereditary mental taint.

As regards the principal anatomical lesion, the cases divide themselves into two sets; first, those in which the corpus callosum is wholly absent or very rudimentary; and

second, those in which a considerable part of the commissure is present. The other anatomical peculiarities arrange themselves under these heads also. Thus, in four cases belonging to the first class, the gyrus fornicatus is absent; it is always present in the second. Again, while the anterior commissure of the third ventricle is present in all the cases hitherto recorded, yet in those of the first class the posterior and middle commissures are usually absent, in those of the second they are always present. These differences point to a difference in the early history of the lesion, which is important psychologically. The corpus callosum is only developed at a late period. About the end of the third month, according to Tiedemann, when the anterior cerebral vesicle has passed far enough backwards to cover in the optic thalami, the anterior parts of the corpus callosum and fornix make their appearance between the anterior parts of the hemispheres. They are gradually developed from before backwards, and are probably not complete before the fifth month. The soft commissure does not appear till much later. If then the dropsy or primary lesion occur at an early enough period, it may prevent the formation of the commissures altogether; or if their development has begun, but is not yet complete, the direction of pressure being upwards and backwards owing to the imperfect development of the roof of the cavities, the posterior part of the commissure system alone may be defective. If again that system be complete before the dropsy occur, or its pressure becomes excessive, then any part of the corpus callosum may be *ruptured*. An examination of the drawing which accompanies Mitchell Henry's paper will show that the anterior part of the brain has been as it were simply punched out. This effect of pressure is still more markedly seen in Birch-Hirschfeldt's case, in which the lesion occurred in all probability at a much later period of life, and was primarily confined to the fifth ventricle. If such be the condition and effects of pressure within the cavities, it follows that in the one class of cases the brain has reached a higher and later stage of development before the primary

lesion occurred than in the other, which, being taken into consideration along with the actual results of the lesion, may help to account for the great differences in mental capacity exhibited by the two classes of cases. Of the eleven cases in the first class, all of them, save one, were more or less idiotic, and that single exception (Malinverni's case), while he could perform his duties as a soldier with ordinary intelligence, is described as being uncleanly in his habits, and having a decided *penchant à la tristesse*. In the second class there were four cases, and all of them showed either ordinary intelligence (Birch-Hirschfeldt's and Nobiling's), or were but slightly below the average (Paget's and Mitchell-Henry's.)

In the first class the soft commissure was present only in three cases (Solly's, Huppert's, and Malinverni's), in the second class it was present in all. This fact seems to confirm the suspicion which Paget* has recorded "whether, notwithstanding the difference of their apparent structure, the middle commissure may not have compensated in a small degree for the deficiency of the corpus callosum." He refers to his own case, in which the middle commissure was 6-10ths of an inch wide, to Solly's case in which it was "wide and thick," and to the case of an "unusually intelligent labourer," in whom it was double. Langdon Down† has come to the conclusion that this is more than a suspicion. He says, "My researches hitherto lead me to attach a physiological importance to the soft commissure which previous observers have not recorded."

The conclusions to which I have come from a careful study of all the cases are these—First, in those cases in which the commissure system is wholly wanting or very rudimentary, idiocy or imbecility prevails; and second, in those in which the corpus callosum is only partially defective, while the other commissures are present, intelligence but slightly below the average, together with dulness or levity, melancholy, or perhaps childishness are the usual mental characteristics.

* loc. cit., p. 59.

† loc. cit., p. 225.

Reviews.

I.—THE WEST RIDING LUNATIC ASYLUM MEDICAL REPORTS. *Edited by J. CRICHTON BROWNE, M.D., F.R.S.E.* Vol. IV. London: Smith, Elder & Co. 1874. pp. 317.

THE present volume of these reports presents a large amount of most interesting material. There are papers containing a review of special subjects, and there are others detailing original observations in various departments of medical psychology.

The first paper in the volume belongs to the former class. It is by Dr W. B. Carpenter, and bears the title of "The Physiological import of Dr Ferrier's experiments." It contains an interesting summary of these experiments, and goes on to consider the inferences which may be drawn from them as to the functions of the cerebral hemispheres. Dr Carpenter believes that, when by electric stimulation of the surface of the brain Dr Ferrier produces movements of the animal, the stimulant does not produce its effects by directly irritating the nervous centres, but rather by increasing the supply of blood to the centres. Hyperæmia of the portion of brain substance was always antecedent to the movement, and occasionally a distinct interval elapsed after the withdrawal of the irritation before the grey matter reached the condition of an explosive discharge. In one of his concluding paragraphs, Dr Carpenter refers to the importance of Ferrier's experiments in relation to the automatic performance in man of movements which originally proceeded from intentional direction. As an instance of an automatic action of a very high class, he relates the following circumstance:—

"The following statement, recently made to me by a gentleman of high intelligence, the editor of an important provincial newspaper, would be almost incredible if cases somewhat similar were not already familiar to us:—'I was formerly,' he said, 'a reporter in the House of Commons, and it several times happened to me that, having fallen asleep from sheer fatigue towards the end of a debate, I found, on awaking after a short interval of entire unconsciousness, that I had continued to note down correctly the speaker's words. I believe,' he added, 'that this is not an uncommon experience among parliamentary reporters.'"

Another paper of the same systematic character is that by

Dr Fothergill, on "Cerebral Anæmia," which treats fully of the symptoms, pathology, and treatment of this condition.

The editor, Dr Crichton Browne, has a paper on "Acute Dementia," which is illustrated by the photograph of a female patient afflicted by this disease. He distinguishes primary acute dementia from that which frequently occurs in persons advanced in years, and that which often follows apoplexy. It is the primary or acute dementia which is treated of in this paper, and as the disease should possess great interest for the general practitioner, we may be allowed to give a brief abstract of it. The disease is much more frequently due to physical than to moral causes. The one moral cause which seems to be effectual in producing it is monotony of thought and feeling—mental inanition. Thus it comes on from monotonous labour in a mill or on a treadmill, &c. Among the physical causes, anæmia is not frequent, and where it is traceable as a cause, it is more frequently an anæmia due to deficient supply of food than from hæmorrhage. Acute diseases which cause much exhaustion have sometimes acute dementia as a sequela—typhoid fever for instance—and this is mostly the case where delirium has been present during the fever. The disease has also been brought on by protracted diarrhœa, by bleeding from piles, leucorrhœa, or menorrhagia; the cicatrization of a lacerated wound has been known to induce it. The disease may steal on gradually, or be ushered in by an attack of excitement. Sooner or later, however, it manifests itself by a greater or less suspension of the psychological activities, and this extreme mental lethargy is the characteristic of the disease. A patient, on being asked her name, is got after a deal of trouble to answer "Elizabeth," and after that she answers "Elizabeth" to every question put to her. A patient started to run, will continue to run on, when left to himself, steadily and rhythmically till stopped by an obstacle. A girl, who previously had to be fed, was got to take her food herself by putting a spoon into her hand, firmly closing the fingers over it, dipping it in the food on her plate, raising it to her mouth and inserting the point of it between her lips. Being once started in this circle of movements, she continued repeating it in the most machine-like manner, and went on doing so long after she had emptied her plate. During the course of the disease there may be little gusts of excitement, but when fully developed the mental state is that of profound stupidity, with anæsthesia of the surface and blunting of the senses. The indisposition for muscular exertion, noted above, deepens into complete lethargy; any pose in which the patient is adjusted by a bystander, may be retained for hours, till altered by force.

There is feeble action of the heart, and blueness of the skin of peripheral parts. In advanced stages there is liability to œdema of the lungs. In females there is constantly amenorrhœa, rarely leucorrhœa or menorrhagia.

In its pathology the disease seems to consist in an atonic condition of the vessels of the brain. The vessels in the brain are presumedly like those of the hands, which are blue and cold. *Post-mortem* there is found that kind of cerebral congestion which results from vascular weakness. The arachnoid is raised from the surface by subjacent serous fluid, the pia mater is thickened and its veins tortuous and varicose, and the brain substance tumid, spongy, and œdematous. These conditions are apparently the result of want of tonicity in the vessels, and this lack of tonicity is explained by the origin of the disease in causes tending to depress the general vitality. The thin yielding vessels cause retardation of the current and even stasis: the natural consequence of these is œdema, and the œdema leads to compression and atrophy, although irritation may have been originally produced. The first excitement thus gives way to stupidity. This venous or atonic congestion affects the whole brain, but especially the frontal and parietal lobes.

The treatment of the disease gives very hopeful results. It is to be remembered that it has its origin in debilitating causes, and hence the patient should be, above all, well nourished. The treatment is best carried out in an asylum, because there adequate nourishment, regular exercise, personal cleanliness, and incessant supervision are enforced. It is sometimes difficult to get sufficient nourishment administered on account of the apathy of the patient. If cold be used in the treatment of this disease, great care must be exercised. The shower-bath is an excellent tonic, but it should not be used for more than ten seconds at a time, and should be followed by brisk friction. The author recommends the application of electricity in the form of the continuous current to the brain, on the same principle as it is used for the treatment of chilblains. He uses quinine in large doses, and guaiacum. If there is anæmia, he gives iron as sulphate or subnitrate. If there are bed-sores (as there should *not* be), he recommends the treatment of Brown-Sequard, namely, alternate poultices of pounded ice, and hot linseed meal—or sprinkling them with iodoform.

The paper, by Dr Lauder Brunton, on "Inhibition, peripheral and central," contains a large number of points of great interest, and the author has taken the pains to illustrate his subject by facts drawn from a great variety of sources. In its conscious exercise inhibition is common to all of us. "The

first lesson that a child gets at school is one of inhibition; it is taught to sit still, and restrain the movements which external impressions acting on its excitable nervous system prompt it to make." The author, however, collects many more definite instances of the restraining or inhibitory power of the nervous system. There are small ganglionic structures in the sub-maxillary gland for instance, and these are in relation to a branch of the chorda tympani nerve, whose irritation causes a suspension of the action of these ganglionic cells, and consequent relaxation of the blood-vessels, and increased secretion of saliva. The well-known inhibitory action of the vagus nerve on the ganglia in the heart, which govern its rhythmical contractions, is another case in point. It is much more difficult to account for these inhibitory actions, and it would take us too far to attempt to give even an abstract of the various views brought forward by the author. The paper, as a whole, is exceedingly suggestive, and we refer the reader who is interested in this subject to it.

In a paper entitled "Pathological Illustrations of Brain Functions," Dr Ferrier pursues a line of investigations which will probably be extensively followed during the next few years, and which is likely to repay those who engage in it by interesting and important results. Ferrier has looked up the records of the West Riding Asylum, and quotes from them cases in which there had been a careful observation of phenomena during life, and an accurate description of the locality of the lesion found after death. From these cases he derives important confirmations of his views on the localization of function in the brain, as deduced by him from experiments on animals. These observations enable him to localize the motor centres of the limbs, face, eyes, &c., and one of them was a case in which aphasia was a prominent symptom. Ferrier is of opinion that "It would be more in accordance with the facts of experiments on monkeys, as well as with the cases which have come under my own observation, to localize the speech centre in the *operculum* (*Klappdeckel*), which is included between the ascending and horizontal limbs of the fissure of Sylvius, and which overhangs the Island of Reil." In connection with the controversy as to the nature of aphasia, he remarks, "In aphasia, the *memory* of words is not lost, nor is the person incapable of appreciating the meaning of words uttered in his hearing. What is lost in aphasia is, as Hughlings Jackson so clearly discriminates, merely the power of *voluntarily* using words to express ideas. As both sides of the brain are symmetrical and work conjointly, the memory of words may remain

in the right hemisphere after the occurrence of lesion in the left. The explanation of the loss of the faculty of speech is to be attributed to the unequal preponderance of the left hemisphere in the inclination of voluntary acts."

In a paper "On the Therapeutic value of Cold to the Head," Dr Benham comes to a conclusion somewhat against the frequent use of this agent, and this on the basis of experiments. It seems to produce a slight lowering of the temperature of the intra-cranial tissues by reflex action; a slight diminution of the temperature of the body generally; and a slight decrease in the frequency of the heart's action. "All these effects, however, are so insignificant in degree and temporary in duration that, taking into consideration the violence of the remedy adopted, one cannot help thinking that a greater effect in the same direction may be more easily produced by other and less violent means, and the patient be saved the pain and discomfort of having his head shaved and afterwards enveloped in a freezing mixture as long as one may dare to continue its application."

The remaining papers are—"On a case of Recovery from Double Optic Neuritis," by Dr J. Hughlings Jackson. "The Urinology of General Paralysis," by Dr J. Merson. "Observations on the Histology of the Morbid Brain," by Dr H. C. Major. "On the Hourly Distribution of Mortality in relation to recurrent changes in the activity of Vital Functions," by Dr R. Lawson. "Ophthalmoscopic Observations in Acute Dementia," by Dr C. Aldridge; and "On the Actions of Nicotine," by Dr Benham.

II.—ÉTUDE SUR L'ANGIOME SIMPLE SOUS-COUTANÉ CIRCONSCRIT, (*navus vasculaire sous-cutané, angiome lipomateux, angiome lobulé*), suivie de quelques remarques sur les angiomes circonscrits de l'orbite. Par le Dr CHARLES MONOD. Avec deux planches. Paris: 1873. pp. 86.

THIS monograph is based on the observation of a case of subcutaneous vascular tumour of the fore-arm. The description of the case is preceded by a *résumé* of the literature of the subject, and a discussion of the synonyms and varieties of this form of growth.

The author's own case is carefully described, both in respect to the naked eye and histological characters. It was a tumour measuring 5 centimetres by 4 (2 inches by 1½), situated on the anterior aspect of the fore-arm, in the subcutaneous cellular tissue, and in no part connected with the skin covering it. Neither was it continuous with the deeper parts, the anterior aponeurosis being left completely intact. It was easily separated

with a few strokes of the knife, and enucleated like a lipoma. In its naked eye appearance, the tumour presented the combined characters of a lipoma, fibroma, and angioma, without it being possible to place it definitely in one or other of these classes. Microscopic examination was prosecuted with great care, and led to very interesting results. The tumour was found to be the seat of widely dilated capillaries, and it was possible, in different parts of the growth, to observe how this dilatation was a progressive one, and how the large vascular spaces in some regions had developed from the normal capillaries. It further appeared that the disease had its starting point in the capillaries of the subcutaneous adipose tissue. It could be traced, in fact, how in one part the fat vesicles were separated by capillaries with walls more and more thickened, and by young connective tissue; while, in another, the capillaries were, by insensible gradation, increasing their calibre, and the connective tissue becoming more and more firm; the fat vesicles, at the same time, getting scarcer and smaller, till they finally disappeared.

After this description of his case, the author enters on a general discussion of this class of tumour. They occur as distinctly circumscribed growths in the subcutaneous tissue; they do not possess a distinct capsule, but it is possible to detach from their surface a delicate layer of cellular tissue, which allows of, and facilitates, their complete ablation. In external aspect, and to the touch, the tumour is lobulated, or at least mamillanated, this being connected with the origin of the tumour, the growth retaining the lobulated form of adipose tissue. The author considers that, in his tumour at least, there was no new formation of blood-vessels, the whole was explainable from the dilatation of the original capillaries: but he does not deny that in other cases there may be such new formation.

The original mode of formation being that mentioned above, the growth may undergo one of two ulterior modifications. In its original development there is an augmentation of the volume of the capillaries depending on a thickening of their walls; followed, subsequently, by an enormous dilatation of their calibre. At the same time there is a formation of fibrous tissue around the vessels, till, finally, the vascular cavities lie in the midst of a fibrous stroma, in which less and less of the original fatty tissue is visible. Now, one or other of these processes may obtain a still higher development. The dilatation of the blood-vessels may go on at the expense of the fibrous stroma, till their walls come in contact, and finally, by atrophy, communications are established. In this way a cavernous tissue is formed, consisting of a series of communicating cavities, separated by incom-

plete partitions, which are really the remains of the walls of the capillaries. The capillary angioma thus results in the cavernous angioma, and this process does not depend, as some have supposed, on a rupture of the vessels, and an excavation of the surrounding tissue into artificial cavities. But, on the other hand, the development of the fibrous tissue may come to preponderate. There is always some connective tissue formed along with the dilatation of the vessels. But the fibrous tissue, making common cause with the walls of the vessels, may increase at the expense of the calibre of the vessels, and an induration of the tumour result. The possibility of an actual spontaneous cure in this way has been long ago suggested, and its actual occurrence has even been asserted. The vascular growth will be converted into a firm fibrous nodule.

The author has only a short paragraph on the treatment, but it is sufficiently decisive. We give it entire:—

“We have only a few remarks to make on the matter of treatment. If, from the preceding study, the readers as well as ourselves have had the conviction forced on us that these tumours are situated under the skin, are distinctly circumscribed, are indeed vascular, but relatively independent of the neighbouring vessels, and, consequently susceptible of complete separation without the fear of serious hæmorrhage, then it will be obviously superfluous, in the case of such tumours, to discuss the numerous methods devised for the treatment of erectile tumours in general. In all the cases which we have reported, the removal has been done with the knife, and with the best results. It seems natural, therefore, to confine ourselves to this mode of treatment, at once simple, effectual, and free from risk. If this work shall have served to bring prominently forward this practical point, which acquires capital importance, as we shall show further on, when these tumours occupy a region of difficult access, such as the orbital cavity, that will be a sufficient excuse for our having made the attempt.”

In an appendix on the circumscribed angioma of the orbit, the author asserts that this tumour is of the same nature as that treated of in the body of the work. In most of the cases observed, the growth was already cavernous almost throughout: but he believes it to have a similar origin from the fat of the orbit, and precisely the same mode of development. Here, also, the tumour is circumscribed, and without intimate relations to the neighbouring vessels, and its ablation is possible, and can be done without danger.

The monograph contains much more that is interesting, and is put in an eminently readable form.

III.—THE FORCES WHICH CARRY ON THE CIRCULATION OF THE BLOOD. *By*
 ANDREW BUCHANAN, M.D., *Professor of Physiology in the University of*
Glasgow. Second Edition. London: J. & A. Churchill. 1874. pp.
 97.

THERE are few departments of physiological inquiry in which the observer can so readily interrogate nature by direct experiment as in that which relates to the character and amount of the forces engaged in the propulsion of the blood. The modern modes of observing and registering the phenomena of wave movement and fluid pressure, by the graphic method, have made such researches comparatively easy, and their results more accurate than in former times. During the past twenty years—more particularly within the last eight or ten—numerous memoirs bearing on this subject, and founded on experiments made with the kymographion and similar instruments, have been written by Marey, Ludwig, Chauveau, T. Weber, Ranke, Donders, Czermak, Lortet, Jacobson, Einbrodt, Sanderson, Fick, and others, by which many important additions have been made to the knowledge handed down from the times of the older physiologists.

Bearing these facts in mind, it is a matter of some surprise to the reader to meet with a physiological treatise, bearing on its title-page the date 1874, written in a manner indicating deep interest in the subject on the part of the author, and the expenditure of no little thought and labour, which, nevertheless, entirely ignores all modern modes of research, all the results obtained by them, and never even refers to any of the distinguished workers of recent times in the same field. Dr Buchanan shows a good acquaintance with the work of the earlier physiologists, but we fear he sympathises as little with the course of modern physiological research, as with what (in reference to therapeutics) he calls “the inert timidity of the present race of medical men.”

The book is divided into three sections. The first treats of the force of the heart, effective and absolute; the second, of the vascular forces; and the third, of the pneumatic forces. The author forgets to mention that it is a reprint from our pages (Vol. II. of present series), to which we refer those who desire to supplement the short statement of the contents for which we can spare room.

The main object of the work, to which two-thirds of its pages are devoted, appears to be that of pointing out the supposed important influence of the thoracic movements as an auxiliary to the heart in propelling the blood.

Professor Buchanan's first section consists in an attempt to

prove that the effective force of the left ventricle and its absolute force are equivalent, each amounting to twenty-two ounces, by which we conclude he means that twenty-two ounces is the measure of the pressure exercised on an area equal to that of the orifice of the aorta during the ventricular contraction. The argument is too lengthy to be followed in detail; to the present writer certain parts of it appear to be inconclusive. Dr Buchanan, however, claims for his results the merit of substantially agreeing with the estimate given by Dr Haughton.

Passing on to the consideration of the vascular forces, the author, after speaking of the elastic recoil of the arteries, expresses disbelief in the influence of the chemico-vital affinities of the blood with the tissues and fluids outside the capillaries as a motive force. If the flow of blood through the lungs of the triton or frog be attentively watched, it will be found to become extremely slow, or be entirely arrested when the animal pauses long between its respirations, although the heart's actions remain vigorous; the moment air is swallowed and the blood becomes oxygenated, the detained corpuscles are seen to flow rapidly on. Having frequently observed this, we cannot agree with Dr Buchanan in considering this supposed force "a pure figment of the imagination."

The most important part of the essay is the third section, which treats of the influence of the pneumatic forces, "the atmospheric pressure towards the heart and chest, rendered effective by a central dilative force."

Modern text books of physiology give perhaps scarcely sufficient prominence to the pneumatic forces as a vasomotor power, and Dr Buchanan does good service in calling attention to them. He, however, greatly exaggerates their importance. The heart and the pneumatic forces, according to him, "divide between them the labour of carrying on the circulation of the blood in proportions not differing much . . . from 3 to 2." (p. 21.)

Dr Buchanan's argument occupies about sixty pages, and consists mainly of a series of propositions, illustrated by eight woodcuts of hydrostatic apparatus. Much of his train of reasoning is ingenious and accurate, but in certain parts it is faulty (*vide* the argument founded on the experiment represented in Fig. 4).

In order to follow the author's chain of reasoning, a reproduction of the woodcuts would be necessary, and the occupying of an amount of space inconsistent with the limits of a brief notice such as the present. The suspicion the reader feels as to the correctness of the reasoning based on

the hydrostatic experiments, is strengthened by the author's very honest and candid admission that of "the figures in various places accompanying the text . . . only one represents an apparatus actually constructed and practically tested." The author further adduces various physiological phenomena by which, as he considers, the influence of the pneumatic forces is attested: *e.g.*, the movements of the brain, and the oscillation of the hæmastic column, coinciding with the respiratory movements. The fact that asphyxia is followed by arrest of circulation may, he considers, "be regarded as the *experimentum crucis* of the doctrine of the pneumatic action of the chest." "When the act of breathing ceases, the heart is deprived of all assistance from the pneumatic force of the chest; it has now to contend single-handed against all the resistance which opposes the onward movement of the blood, a task for which its utmost efforts are ineffectual." (p. 71). If this be true, how does Dr Buchanan account for the fact that, when the heart and lungs of an animal are exposed by the cutting away of parts of the thoracic wall, and artificial respiration is established by a bellows-apparatus connected with the trachea, circulation continues as perfect as before?

There can be no question that the force of the heart is fully competent to maintain the circulation without aid from the suction of the chest movements; still these have a certain appreciable influence. The pressure of the atmosphere on the vessels at all points of the body is equal to that of 760 mm. of mercury. In the thorax, however, at the moment of the pause occurring between expiration and inspiration, a counteracting force operates, viz., that of the elasticity of the lung, estimated by Donders at 7.5 mm. of mercury. This difference of 7.5 mm. pressure must tend to favour the flow of venous blood into the great veins of the thorax and to the right side of the heart. During an ordinary inspiration, according to Professor Wundt, the inter-thoracic pressure falls 8 or 9 mm. lower. In a forced inspiration it falls 30 to 40 mm. In addition, the descent of the diaphragm increases the pressure on the veins of the abdomen. Thus, inspiration must aid the flow of venous blood into the thorax. It slightly retards the flow, and diminishes the pressure in the arteries. Expiration, on the other hand, retards the venous current, increasing the inter-thoracic pressure. It has, however, a favourable influence on the arterial stream. Nearly all observers concur in the opinion that expiration accelerates the flow in the

arteries more than it retards that in the veins. (*Wundt's Lehrbuch*, p. 314).

Thus the experimental inquiry as to the effect of the thoracic movements on the circulation corroborates to some extent Dr Buchanan's opinions; but gives no support to his very exaggerated estimate as to the relative importance of the pneumatic forces as compared with that of the heart.

Dr Buchanan's work presents many points of interest; but, viewed as a scientific treatise, it must be confessed that it is too much behind the age to be of any great value.

IV.—DENTAL PATHOLOGY AND SURGERY. *By* S. JAMES A. SALTER, M.B., F.R.S., *Member of the Royal College of Surgeons, and Examiner in Dental Surgery at the College; Dental Surgeon to Guy's Hospital.* London: Longmans, Green & Co. 1874.

THE writer of this book is well known as a contributor both to general and to special medical *Journals*, as well as to the transactions of various learned societies. He has also assisted in the compilation of the "System of Surgery," edited by Mr Holmes, by his learned paper on "Surgical diseases connected with the teeth."

Having thus been an active student in the field of research, he has naturally looked with expectation that glory might crown the labours of his investigations, and that he might gain such notice and congratulations from his medical brethren as less deserving workers have received. But fortune is ever capricious in the dispensation of her favours, and while the cause has been furthered and enriched, the labourer has been misconstrued or ignored. In the present volume, which is a digested collection of his previous papers and essays, he has put forth his views in justification of his lawful rights, having "been incorrectly quoted by high authority, and in some instances, his scattered writings having been used without acknowledgment."

As in nearly all books on diseases of special organs, the writer begins with the general anatomy of the teeth; but it is to be regretted that in this book, which may be considered by the medical profession and those pursuing the specialism of dentistry exclusively, as a valuable addition to dento-medical literature, he does not enter into more lengthened histological detail. He states, however, that it has been his desire, as far as possible, only to express views where he could do so with authority, or at least as

the result of independent thought and investigation, and only so far to enter upon a description of the development, structure, and physiology of the teeth as might be subservient to the study and illustration of diseases peculiar to them; we may therefore overlook its comparative meagreness, and touch in review those parts which are of intrinsic value for the succeeding surgical considerations, and which may be said to flavour of originality.

In treating of the sclerous substance of the teeth, he accounts for the statement made by Retzius that the enamel close to the dentine contains more animal matter than elsewhere, by the fact, proved microscopically, that close to the dentinal surface the dense fibres of the enamel are frequently seen to be separated from each other, and the dentinal tubes to protrude between them, the latter structures having a much greater amount of animal matter than the former. Kölliker regards this as being of a pathological nature, but our author does not venture an opinion regarding it.

At page 10, he shows that the alternation of developmental force appears in all the sclerous structures (but chiefly in the dentine), in the lamination of these tissues producing what he calls "incremental lines." These are interesting pathologically as forming permanent registers of intimate growth, complete and incomplete, and cause the teeth to contain indelible evidence of defective nutrition at the time of their formation. These lines (the same that Owen described first as "contour lines") are pathologically demonstrated at page 98, where he records his having found two kinds of inflammatory patches in the dentine, one in radiating lines from the centre to the circumference of the tooth, the other in belts parallel with its surface, and reasons, *a priori*, "that the radial patches were inflammatory, and the hæmatic colour confined to the tubes, while the contour bands were developmental, and the stain in the intertubular substance." In the chapter treating on caries at page 87, he alludes to these lines, "With low power the carious dentine is seen to show marked tendency to crack and break up in two nearly opposite directions; in the line of the tubes, but still more in the course of the calcification," that is, along the contour or incremental lines.

In chapter ii., he treats of the important part teeth play in the formation of articulate sound, and before describing how the sounds in which the teeth are immediately concerned are effected, he enlarges upon the mechanism of arti-

ulation in a succinct and intelligible form. He says (page 18): "The principal way in which teeth assist in the production of articulate sounds, is by acting as an arch, or horseshoe-shaped ridge, within which and against which the tongue may act as a valve, and by pressing against which it may produce modified and variously placed partial and complete closure," and again, page 19, "It is this approximate coincidence of shape, and close propinquity that make the instantaneous application of any part of the edge of the tongue to the corresponding part of the dental arch of either jaw so easy, and this it is also that makes any considerable dental irregularity, or deficiency, destroy, by preventing this application, the power of producing certain articulate sounds." This subject is altogether eminently deserving the attention of dental surgeons, as the perfect coincidence between the teeth and tongue is ignored in attempts to restore dental deficiencies.

Based upon the principles which he lays down, he has constructed a table of what he calls a physiological alphabet, the arrangement of which is founded "upon the situation of the closure by which the sound is produced, the completeness or incompleteness of the closure, and upon whether the breathing is soft or aspirated;" and shows how completely symmetrical the whole subject is, and what a parallelism runs through it.

In the following three chapters much information for the dental student is afforded, and especially on the important subject, "irregularity of teeth," the account of which, although limited, is at once in some cases novel and ingenious. Those of the more common appearance are clearly described and the mode of treatment pointed out.

Chapter vi. is devoted to the consideration of secondary deposits within the cavity and substance of the teeth. It is interesting as it is scientific as a synthetical corroboration of the previously recorded histology. He takes exception to the usual nomenclature. We shall best explain his authority for doing so by extracting two paragraphs from page 61: "The terms 'osteo-dentine' and 'secondary dentine' have been applied respectively by Professor Owen and Mr Tomes to designate some of those forms which are thus produced within the primary single system of the tooth, developed from one original pulp: the former referring, and being applied to structures normal and abnormal, both in man and other animals, and the latter being used by its author in relation to those quasi-morbid or truly morbid products, which are

formed in the injured and diseased teeth of the human subject. The two terms have been applied by anatomists in respect to human teeth, as synonymous and parallel expressions, but really they are not so; for whereas *osteo-dentine* refers to an inconstant anatomical condition, *secondary dentine* has a general physiological meaning, and refers to period of formation." "Secondary dentine" is, as it were, *generic* of the whole; 'osteo-dentine' is specific, and applies to that one form of secondary dentine in which the new tissue consists of a series of dentine systems arranged around isolated blood-vessels, or secondary pulpules." Thus he deems this nomenclature not only incomplete, but inaccurate, and holds the term "secondary dentine" to be applicable to all after-formations of dentine; and, according to the anatomical distinctions, divides it into *dentine of repair*, *dentine exerescence*, and *osteo-dentine*—an arrangement which recommends itself to the student for pathological accuracy, as it does for originality. In dentine of repair, he clearly shows that the deposit takes place at the extremity of those tubes whose peripheral extremities are the subject of irritation (and to almost represent the external surface lost, either by disease or mechanical abrasion). Thus the deposit is not necessarily "mathematically" opposite the seat of injury, but "physiologically" in that position, where the tubes take an oblique course. He takes exception to the generally received idea that it is in the teeth of old people, and in teeth worn down on the cutting edge, that the pulp cavity becomes diminished in size by the secondary development of dentine. The circumstance of age he considers quite accidental, and proves that "mere wear" is not a cause, the enamel being the structure influenced, and not having sufficient vitality to take cognisance of the injury done to it; but that it is when the dentine (an impressionable structure) is influenced, that the deposit takes place, it being "capable of receiving impressions, and of propagating them to a proximate organ, which legitimately has the power and the office of restoring it, and repairing the lesions it has suffered."

In the consideration of caries, he begins by drawing attention to the singularly inapplicability of the term as relating to the teeth, for as they differ from bone in structure physiologically, so in disease they have no similarity, but in the succeeding pages he falls into the use and wont error, and retains the name caries, instead of the simple word "decay," which he suggests as conveying the best idea of the disease in question. He adheres to the belief that it is essentially a superficial affection, dependent upon external influences, modi-

fied by vital actions, and in addition to the chemical theory of disintegration, he alludes to the growth of the *Leptothryx*—a cryptogamic vegetable growth, which he believes to pervade all carious dentine, and which perhaps grows at its expense. He goes on to describe, as a characteristic peculiarity of dental caries, its smell, which is constant, and quite unlike any other odour that emanates from the human body, not excepting that from the neighbourhood of diseased bone. The cause of this stygian effluvium he does not attempt to explain, but we presume to be the result of chemical influences. He merely touches the subject of prevalence of tooth-decay as compared with past ages, and makes the usual apology of advancing civilization for its frequency, without showing what are the defects produced by this otherwise improved condition of life, which so tends to retard our physical perfection.

In treating on the mechanical injuries to the teeth, he deals of abrasion and erosion under the new name of "surface wear," believing them to be essentially the same conditions, and the anatomical characters precisely similar. Fracture of the teeth he divides into simple and compound, where the hard tissues alone are fractured, and where the pulp chamber is opened, and its contents exposed or lacerated. When fracture of the fang occurs he believes union to be sometimes brought about "by a fresh growth of the dentine and crusta-petrosa, the latter having a tendency to be in excess and encroach on the former." Wedl supports this theory, and demonstrates it with fourteen cases in which fracture was cured by re-union of the hard tissues.

Under the name of "odontomes," in chapter xi., he treats of all the tumours formed by the increased and perverted growth of the hard tissues of the teeth; and submits the following simple arrangement:—

Congenital odontomes—Warty teeth, Hernia of the fangs, Enamel nodules on fangs.

Secondary or induced—Exostosis, Dentine excrescence.

This arrangement commends itself as being simple, sufficiently comprehensive, and more convenient than that made by M. Broca, who first classified these abnormalities under the term "odontomes."

Our author was the first to apply the term "warty teeth," and to describe their histological condition. Being a morphological change in the membrane surface, occurring in the development of the teeth, it bears the same relation to a normal pulp as a tegumentary wart does to normal papillary structures. In a few cases he clearly points out their interest

in a surgical point of view, and the error of diagnosis they are apt to lead the surgeon into, bearing, as they do, a close resemblance to necrosed bone in some forms, and in others to malignant tumours. In one case he shows this extreme liability to error of judgment, and its disagreeable consequences, (page 113):—"A young man about 20 years of age was admitted into a metropolitan hospital, having a mass resembling bone within the mouth on the upper surface of the angle of the lower jaw on the right side. The mass had been gradually rising in the mouth for some time, and was, when the patient was admitted, as big as a walnut; and, by its continued projection, had gagged open the mouth. To all outward appearances this mass very much resembled a piece of porous bone denuded of periosteum, and this, indeed, it was considered to be. For the purpose of extirpating the mass, a portion of the angle of the jaw in which it was implanted was removed, and subsequently, to ascertain its anatomical structure, a vertical section was made through the whole. This at once disclosed the nature of the peculiar growth, and showed that it was in reality a malformed tooth in a state of warty complication." The subsequent history of this case is very interesting, both as illustrative of the error in diagnosis, and as resulting in destruction of (what we agree with Mr Salter to be a point often ignored) the continuity of the dental arch. The lower jaw was drawn over to the one side by the action of the muscles, until the left lower canine about corresponded with the interval between the two superior central incisions, thus destroying the facial symmetry and the powers of mastication for ever.

From the practical bearings and importance of this subject we make this quotation, (page 121):—"It should be borne in mind by surgeons, that teeth occasionally exhibit such change of form and aspect that they can no longer be recognised as teeth, and that they may (as has happened) be mistaken for necrosed bone. It should be remembered too, that, under such circumstances, the ungainly mass does not require the scalpel and saw for its removal, but that its extraction may be accomplished by the same instruments as are employed for taking out ordinary teeth."

Hernia of the Fang.—This was formerly considered to be exostosis—but this the author shows, by an examination of its histology, to be quite erroneous. He demonstrates this class of tumours to contain the different constituents of the fang, whereas exostosis consists of *crusta-petrosa* only. Referring to the examinations of a fang tumour, he says (p. 126):—"The outer layer is one of ordinary *crusta-petrosa*, such as is seen on

healthy tooth fangs; it is laminated, non-vascular, and with the usual scattering of lacunæ, parallel to the axis of the laminae. The layer of dentine is equally conspicuous and unmistakable: and, as is usual, the tubes have a general direction at right angles to the pulp cavity, and to the external surface of the growth of which they form part." Dental exostosis contains no tubes, and is an extraneous growth deposited outside the dentinal system.

Dental Excrescences he considers to be the probable cause of many cases of unexplainable neuralgic sufferings. They may go on increasing in size in the pulp chamber, until they press the nerve on the opposite wall, without changing the external appearance of the tooth in the slightest degree, and properly recommends that in all cases where the tooth, removed in order to relieve suffering, is found to be without morbid change, a careful examination of the interior of the tooth should be made, and an intelligible result recorded, "so that our knowledge of obscure tooth-pain may become more definite."

This chapter on tooth-bone tumours is carefully written, showing a large amount of original observation, and equally well worthy the consideration of the dental specialist and of the general surgeon.

Suppuration of the Tooth Pulp is one of its commonest changes, and by analysis our author attempts to show that this condition is much more frequent than generally imagined, and believes that pus in small quantities is developed in many cases which ultimately end in complete recovery, and the restoration of the tooth to the peaceful performance of its functions. This, however, must be only in cases where the inflammation is not acute, and is unaccompanied by deep lesion of the structures. When suppuration is fairly established in a case where the pulp chamber is still unopened by disease, the morbid changes may be clearly seen by crushing a recently extracted tooth in a vice. A portion of the pulp chamber, more or less, will be found filled with yellow pus, while another portion of the cavity is still occupied by healthy pulp—exhibiting no other change than a little extra vascularity. But the point of interest is the appearance of that portion which lies between the diseased and healthy part. Approaching the pus the healthy pulp presents a deep red line of demarcation, while between this and the pus is a mass of diffuent slough of a dirty greenish colour. This is apparent to the eye. It is worth mentioning, for a more perfect knowledge of the treatment in such cases, that Mr Salter has observed suppuration generally to commence in the part adjoining the dentinal caries. These conditions are diagram-

atically illustrated with great faithfulness. The formation of pus is very frequently seen in temporary teeth; and in the illustrative specimen a few minute drops of pus are seen isolated here and there, and *each* surrounded by the dark red line. This pathological condition he has often found in the teeth of children, even when they have been but slightly painful. The microscope discloses the red line of separation to be occasioned by the dilatation of the blood-vessels into ampullæ, filled with clots; these dilatations are doubtless produced by the loss of vitality of vessels near to the slough. "The vital contractility having ceased, the force of the blood currents dilates the thin walls, and the contained blood coagulates." He considers this change to take place in all sloughing surfaces, though it can never be so clearly demonstrated as in the tooth pulp; affording, as it does, exceptional opportunities for making observations, by the ease with which it can be isolated and examined. The facility with which the tooth pulp suppurates is probably caused by the persistence of the primitive cellular condition, which there exists so largely. This is in accordance with the theory of Virchow, who has shown that pus is formed in parenchymatous organs by the proliferation of the development cells of the connective tissue.

Chapter xiii. is devoted to the consideration of "Tumours and other affections of the Gums," in which "epulis, polypus of the gums, vascular and warty tumours" are graphically described in a pathological point of view, interspersed with figures and cases illustrative of these affections. Epulis tumours are always a form of "fibro-plastic," a combination of fibrous tissue and myeloid cells; the proportion being indefinite, generally the main bulk consists of fibrous tissue; but sometimes the myeloid cell element forms the major part of the growth. They are always associated with porous vascular bone. Such being their deep connection, we cannot agree with the idea of attempting a cure with any half measures; but would at once, on deciding as to the nature of the tumour, completely extirpate the parts involved, which will seldom extend to the compact structure of either jaw, on no occasion interfering with the continuity of the maxillary arch, if the tumour should be situated in the lower jaw. We think merely cutting away the tumour and the application of nitric acid will never eventuate in complete restoration of the parts to health. The subsequent absorption of the alveolar process (in which the disease is) following the extraction of a tooth, may effect, in time, a cure; but it will be expedited by anticipating the natural process of absorption, by the more speedy method of judicious surgical interference.

From the frequency with which the mucous membrane of the mouth is affected by constitutional syphilis, these manifestations receive some consideration. The tongue more generally suffers than the gums, and dental surgeons frequently see such cases, inasmuch as sores of the tongue are often attributed to some irritation of a tooth—the offending tooth having only localised the constitutional disease. The affections attacking the mucous membrane of the gums that are described, are, psoriasis, ulceration, and condyloma. Psoriasis is described in a case which occurred in the author's practice. The appearances were these, "At the back part of the upper-jaw on each side, the mucous membrane and gums were swollen, thickened, and red, with here and there white patches. There was a great increase of epithelial growth, which was in parts soft and sodden, and in other parts hanging in shreds from contiguous red, raw-looking patches. It suggested to me a condition such as psoriasis palmaris would exhibit if constantly immersed in fluid." This he traced to a distinct syphilitic origin—the diagnosis being corroborated by the cure of the disease under the treatment of iodide of potassium, after other treatment had failed. Condylomata of the gums are very rare, and are also illustrated in a case of undoubted syphilitic origin; the case presented rounded eminences on, or rather in the gums—apparently circumscribed plastic exudations—and were associated with "glossy tubercle" of the tongue and ordinary condylomata in other regions of the body.

An original mode of treatment is mentioned in a case of bleeding from true scurvy gums in a female of marked hæmorrhagic diathesis, which all other efforts had failed in controlling. It was observed that lateral pressure with finger and thumb arrested the bleeding, which recurred immediately it was removed. The idea was conceived that this pressure might be kept up by means of a spring bent like a horse-shoe, the opening between the extremities being narrower than the distance between the inner and outer aspects of the gum. This was applied for a night, and in the morning it was found to have produced much swelling of the parts and considerable suffering, so much so that it had to be removed, when it was found that the bleeding did not return. The probable explanation of this was that the little clip had left its equivalent behind it in the tension of the swollen gum. In his own words, "the extrinsic pressure of the spring had been succeeded by the intrinsic pressure of the swelling."

He describes a singular morbid phenomenon under the name of "Transparent hypertrophy of the gums." This would seem to be an insensitive and nearly bloodless growth of the gums, and one of the most remarkable features of the disease—as was seen in a case given—is the stagnation which follows the extraction of the tooth adopted for its cure: instead of the wound healing and the parts returning to health, it goes on without any apparent change for a very long time. The appearance of this certainly uncommon disease we give in his own words, "The change consists in the slow and gradual hypertrophy of the extreme edge of the gum, at first like a cord, and very sharply marked from the immediately contiguous healthy-looking structure, but the most remarkable circumstance is the singular colour of the hypertrophied part—it is pale pink and semi-transparent. It is very callous and insensitive, and scarcely bleeds when cut. As the disease progresses, the hypertrophy of the gum-edge increases, but it does not alter its character or lose its sharply-defined limit."

A very interesting chapter is given upon those fluid-containing tumours, known as "dentigerous cysts," occurring in the maxillary bones, and dependent for their origin upon the impaction of misplaced teeth. They are totally distinct from those tooth-bearing cysts which are found in the ovaries of females, or elsewhere; in either sex dentigerous cysts occurring in the jaws are merely the result of misplaced teeth, or tooth germs, belonging to the jaw which contains them, while the other kinds of dentigerous cysts neither belong to the individual in whom they are found, nor are they adventitious growths of disease. The morbid history of this class of disease may be summed up in the following extract—"When a tooth is impacted in the jaw, it is enclosed in a bony socket lined by periosteum, as in ordinary circumstances, while the crown of the tooth is free in a little bony loculus, lined with that which was the so-called 'enamel pulp.' This structure is clothed with a sort of epithelium which is apt to assume the function of secreting fluid. After the enamel is completely formed, the soft membrane which rests upon the surface of the crown of the tooth frequently separates from it, the interval being occupied by a sort of serum. This is probably the result of some irritation or difficulty in tooth cutting, and when the irritation runs on to acute inflammation, as in some cases of tedious eruption of the wisdom teeth, the secretion may become purulent. In the cases of deep-seated impaction of

teeth, the action is, I believe, always slow, and the secretion almost always serum."

As pathological specimens of these cases, as of all others which do not immediately kill or shorten life, are necessarily rare, we will extract the description of one seen by the author, which will elucidate the histology of dentigerous cysts, and which shows the enlargement to be dependent upon capsular extension, and not, as it has been hitherto described, an expansion of the antrum itself. This case showed that the teeth had developed in normal number and natural position. The turbinated bones are gone, and the antrum was open. He says, "In the antrum, starting from its base, but not attached to its internal walls anywhere, is an exceedingly thin, delicate, capsule of bone, about the size of a chestnut, white, with a granulated surface. The long capsule contains nothing but a supernumerary tooth, which is loose and free in the cavity. There are three important points in this specimen, bearing upon the anatomy and history of these cases. The tooth is a supernumerary one: it is free and wholly detached in the cavity of the cyst; and further, the expansion is not that of the antral wall itself, but a distension of that which was the bony locus of the contained tooth, which by its further dilatation would have expanded the antral wall, and probably have been confounded with it."

The treatment of such cases is self-evident—evacuate the contents of the cysts, remove the impacted tooth, and if there is much expansion, remove some of the dilated bone. Although this is very simply expressed in words, yet there are sometimes difficulties from the position of the impacted teeth in getting them within the grasp of the forceps, that it may become necessary to devise a form of instrument to suit the peculiarities that may exist.

The importance of the consideration of this subject, which our author has given in intelligent terms, cannot be overstated, either for the general or dental surgeon, as in some cases large portions of the jaw have been removed for dentigerous cysts, which was quite unnecessary, and the result of imperfect knowledge of the real nature of the disease.

An important subject is dilated upon, which claims the closest consideration—"Painful eruption of wisdom teeth." It is one which Velpeau has justly remarked as having been "too much neglected by medical men." So diversified are the forms in which the different eruptions of wisdom teeth present them-

selves, that they have been mistaken for scrofulous caries of the jaw, for syphilis, and for cancer, and besides the severity of the local symptoms, those of a secondary or sympathetic nature are extensive, and sometimes disastrous. Our author has seen a case of partial paralysis of the arm of the affected side, which was the result of an impacted wisdom tooth. There are cases in which it was clearly proven to have occasioned epilepsy and delirium, and Velpeau records the case of a lady labouring under mental derangement, who was completely restored by the liberation of an impacted wisdom tooth, by means of cutting the gum with a lancet. From the frequency of these cases and their extensive sympathetic connections, we would recommend a reading of this thoroughly practical chapter.

From the situation of the teeth, and the large bulk of nerve tissue supplied to them, it may be readily understood the eminent part they play in exciting disease in important contiguous structures, and, by the conditions of extreme irritation to which they are exposed, we can readily comprehend their prolific tendency to produce remote or reflex nervous disturbance; so our author considers, in a chapter upon "nervous affections arising from tooth disease," the salient points of both direct and reflex influences, where a number of cases from his own experience and those of recorded authority are quoted, in which is shown the importance of tooth-disease in the production of affections as epilepsy, neuralgia, paralysis, and some forms of amaurosis. Limited space, we regret, prevents us from entering fully upon this division, which is fraught with so much physiological as well as pathological interest, but we would recommend a reading of the cases given, to the specialist in diseases of the eye and ear, as well as to the general practitioner.

Likewise, that most remarkable of all the secondary consequences dependent upon dental disease, necrosis and exfoliation of the maxilla, arising from the impregnation with the fumes of phosphorous-oxide. Probably there is nothing in pathological history which has been more clearly illustrated than the connection between phosphorous fumes, dental disease, and alveolar exfoliation, and the author clearly shows the coincidence of ideas entertained simultaneously by the different European authorities as to the question of its cause and effects. Besides the chemical respirators suggested, he wisely recommends a periodic and rigorous scrutiny of the mouths of all the work-people employed in lucifer match manufactories, and that those having faulty teeth should be excluded from the rooms where the obnoxious gases are being developed, and those with carious teeth should have them extracted or thoroughly plugged, as it

is satisfactorily shown that impregnation takes place through defective tooth structure, the poisonous material being held in solution by the saliva.

To the dental student there are some excellent hints regarding the scientific and mechanical knowledge requisite for the skilful and adroit extraction of teeth, and a consideration of the respective merits of the instruments which generally comprise the dentist's armoury, and the proper mode of applying them.

The work is ended with a chapter on cleft and perforate palate, in which we may say that mechanical dentistry shows itself as a useful auxiliary, a help-mate to oral surgery, for with all the beauties and niceties of Staphyloraphy it is frequently only second to the work of the artificer. The various forms of obturator are illustrated, which by experience have proved the most effective in procuring perfect occlusion, and, to say the least, much improved enunciation.

In conclusion, we cannot too gladly welcome this book into the library of medicine and surgery, as another pillar upon which to base the scientific treatment of a class of diseases which is the commonest that humanity is heir to, and one which in the education of medical students is frequently debased, if not entirely ignored. Among the students who attend the general hospitals, they are comparatively few who know with certainty where and under what circumstances they may have to pursue the practice of their profession—whether in the metropolis, in the rural districts, or the sea's highway; so that, while the opportunities for practical acquaintance with dentistry are so few, the study of this well written book may tend to render the requirements of the remote practitioner to be equal to the advantages of those living in cities, and consequently surrounded with opportunities of assistance from the dental specialist. From its erudite merits, and scientific interest, we would recommend to the general practitioner a reading of this work on a class of diseases which absorbed so much consideration from the immortal John Hunter. And to his fellow-worker, the student of dentistry, we would say, that in this volume he will find a pretty sure basis upon which to found the correct diagnosis and skilful treatment of nearly all the obscure cases that may cross his professional career.

Exchange Journals.



By DR JOSEPH COATS, *Lecturer on Pathology in Glasgow University.*

REICHERT AND DU BOIS-REYMOND'S ARCHIV.

1874. PARTS 1 AND 2.

CONTENTS.—I. Contribution on ossification, by Dr A. v. Brunn, Göttingen (Plate I.). II. New investigations on the production of heat and interchange of nutrition, by Dr H. Senator, Berlin. III. Investigations on the transverse and longitudinal currents in the muscles of the frog, with contributions to the physiology of the motor end plates, by C. Sachs. IV. The determination of the weight of the organs of the human body, by Dr G. v. Liebig, Reichenhall. V. On the development of the ovary in the horse, by L. Born. VI. A historical contribution to our knowledge of the torpedo, by Dr F. Boll, Rome. VII. On the origin of diseases from exposure to cold, by Dr F. Falk, Berlin. VIII. Physiological and anatomical investigations on the sensory nerves of muscles, by Carl Sachs, Berlin. IX. On the unsymmetrical formation of the head of the pleuronectids, by C. B. Reichert (Plate V. and VI.). X. On decomposition in the stomach, and the gases with a yellow burning flame, by Dr A. Ewald, Berlin. XI. Historical investigations on the glandulæ utriculares, by Dr Hausmann, Berlin.

I. The Process of Ossification (*Brunn*).—The observations in this paper are based on the investigation of the process of ossification, prosecuted chiefly on perfectly fresh objects, though not entirely confined to this method. The author made fine slices with the saw of the fresh bones of calves principally, and from these slices he then cut still finer longitudinal sections with the knife; these he examined in a solution of common salt of the strength of 0.5 per cent. He very properly insists on the advantages of examining the animal tissues in a fresh state, as errors are apt to occur from mistaking appearances produced by the re-agents for the actual structure. He describes here certain elastic fibres which are met with in the ossifying cartilage near its border, but extend thence into the actually ossifying layer. Their object seems to be to support the bone during the process of ossification, and they exist wherever, on account of a quick growth, there is a rapid solution of the cartilage.

They exist further wherever the cartilage is soft, and the bone has to exercise considerable resistance against external violence. Their direction is always at right angles to that in which displacement is to be feared. They furnish, therefore, at once a support to the bone, and a surface on which the newly formed bone can be deposited. The author names them the elastic supporting fibres (*Stützfasern*), and after he had observed them first in the metacarpus of the calf, he was able to distinguish them in all the long bones of children, as well as of young rabbits, dogs, and cats. He has not found any mention of their existence in the literature of the subject. The rest of the paper is concerned with the cartilage cells. They are not, as many depict them, shrunken corpuscles, but in the fresh state are plump and formed of a water-clear protoplasm containing a few granules, just like other cells. They completely fill the cavities in which they lie. The author believes that the cartilage cells persist in the medullary spaces of the ossifying layer as medullary cells, and that they form the osteoblasts, and have, therefore, essentially to do with the formation of the new bone. With certain other authors, he believes that the greater number of the osteoblasts are converted into the basis substance of bone, but that some remain as the bone corpuscles. The bone canaliculi arise afterwards, according to his observations, by absorption.

IV. The Weight of the Organs of the Human Body (*Liebig*).—The author of this paper has made the most careful observations of the weight of all the different organs and parts in the bodies of two presumably healthy men, who had committed suicide by hanging. He gives the most careful measurements, of the skeleton and muscles in the various regions, of the brain and nervous system, the various glands and viscera, the skin, intestine, and so forth. To these he adds six observations recorded by Bischoff, and takes all into account in deducing his general conclusions. The results are too numerous and too minute to abstract fully here, so we shall content ourselves with giving a few of them. The weight of the skeleton seems to bear nearly the same proportion to that of the entire body, in the newly-born child as in the adult. It is about 24.7 per cent. of the entire weight. But the percentage weight of the soft parts varies much. The muscles are proportionally double in the adult as compared with the new-born child, while the viscera are reduced in the proportion of three-

fifths of their percentage weight in the child. The great proportional weight of the brain in the child is very striking; it is 12 to 18 per cent. in the child, and 2 to 3.9 per cent. in the adult. In the newly-born child it is half the weight of the entire viscera, in the adult it is only a sixth. In the adult the liver is almost the same in weight as the brain; in the new-born child it weighs only half what the brain does, and yet in relation to the entire body it is nearly double as heavy as it is in the adult. The brain is, of all organs, the most constant in its weight. It is, to begin with, by far the heaviest of the viscera, but increases in weight much more slowly than the others. Like the liver, the kidneys are proportionally heavier in the new-born than in the adult, though the difference is nothing like that between the brain of the new-born and adult.

X. Character of the Gas in Eructations from the Stomach (Ewald).—Hitherto, observations have seemed to show that the gas developed in the stomach during decomposition is chiefly a hydrogen gas, burning with a blue flame. But the author has met with a case in which the gas burnt with a yellow flame, showing that it was a hydrocarbon. He set to work to investigate the chemistry of the process by which such a gas is produced, but, after a long series of observations, he contents himself with the observation of the fact.

VIRCHOW'S ARCHIV.

VOLUME LXI., PART III. SEPTEMBER, 1874.

CONTENTS.—XVI. Once more on Keratitis, by Prof. J. Colnheim, Breslau. XVII. On the changes of the muscular tissue in certain infective diseases. From the Pathological Institute in Berlin, by Dr Leo Popoff, St Petersburg (Plates XIV.-XVI.). XVIII. On the formation of glycogen in the liver, by Dr G. Salomon, Berlin. XIX. Dr Symphorien Champier, teacher of the physician Michael Servet, in Lyons, by H. Tollin. XX. Contribution on the origin of metastasis of tumours by means of embolism, by Dr C. Andrée, Breslau. XXI. On the regulation of warmth, by Dr F. Riegel, Cologne. XXII. Smaller communications: 1. The communication of the infective poisons by respiration, by Dr Falger, Münster. XXIII. Extracts and reviews—A. Blanck.—The physicians of Mecklenburg, from the earliest times till the present, with short statements as to their lives and writings.

XVI. Source of Pus-corpuses in the Inflamed Cornea (Cohnheim).—In the number of this *Journal* for April of last year, p. 262, a paper by Boettcher is abstracted, in which it is stated that this author had produced a central inflammation of the cornea, and that this fact seemed strongly confirmatory of the view that the pus-corpuses have a local origin, and are not altogether derived from the blood, as Cohnheim asserts. The present paper, by the last named author, is chiefly in answer to Boettcher, although Stricker comes in for a few sharp strokes. Cohnheim explains the central inflammation produced by a seton or the cautery by saying that in these cases the cornea tissue is opened, the epithelium being removed, and that then fluid and wander-cells can pass from the conjunctival sac through the opened tissue. These cells in this way impregnate the tissue around the loss of substance, but whenever the epithelium is renewed, their passage into the cornea ceases, and they spread throughout the cornea, which clears up, and the cells finally disappear.

XVII. The Waxy or Colloid Change in the Muscles in Fever (Popoff).—This paper is chiefly devoted to the consideration of this change of the muscular fibre, but also takes into consideration certain other alterations. The chief of these is the process described first by Virchow, consisting of a parenchymatous inflammation of the fibre or cloudy swelling. The present author bases his paper on the observation of 28 cases, of which 8 were cases of relapsing fever, 6 of typhoid, 4 of typhus, 1 of typhus and relapsing, 4 of puerperal fever, 4 of cholera, 1 of pyæmia, 2 of hydrophobia, and 1 of pneumonia. He examined chiefly the recti abdominales muscles, the diaphragm, the pectorals, and the adductores femoris. They were always examined fresh, and again after hardening in Müller's solution. He coloured his specimens with carmine and picro-carmine. In the muscles examined, cloudy swelling was the most frequent change, and it was very characteristic in cholera and puerperal fever. The waxy change was most frequent in typhoid, typhus, and relapsing, but it was generally present in a minor degree in typhus, although there were often considerable hæmorrhages in the muscles. Of all the muscles the diaphragm is most frequently and most intensely affected. The author asserts that this waxy change is essentially connected with a proliferation of the nuclei of the muscular fibre, and this proliferation goes on till the

place of the muscular fibre is taken by collections of cells or nuclei. These cells have all the glassy transparent look of the waxy muscular fibre, and, unless in tinted specimens, they are very difficult of observation. The appearances are illustrated by several very elaborate coloured plates. The glassy waxy fibre is thus, to begin with, a collection of cells or nuclei, and the process is probably a kind of inflammatory one, or at least with inflammation as a basis. There is some chemical change doubtless, but this is probably less than we would be prepared to expect, as the muscular fibres with polarised light have not lost their refraction, whereas those in the state of cloudy swelling have. The author differs from Waldeyer in his ideas of the nature of the process, that author considering it due to a coagulation of the muscular substance, possibly produced by too firm contraction. It will also be noticed that he differs from an author whose paper is referred to in our last number, p. 110.

XVIII. The Formation of Glycogen (*Salomon*).—The author, at p. 377, thus sums up the essential results of his investigations. The liver of the living animal contains sugar. Gelatine is a former of glycogen, and olive oil is so in a minor degree. Milk-sugar and fruit-sugar form glycogen, mannite probably does not. The primary acetyl derivatives of cane-sugar decompose in the animal organism into acetic acid and sugar; the former is probably burnt, and the latter acts as usual in the formation of glycogen.

XX. On the Formation of Metastatic Growths by Embolism (*Andrée*).—A case is here reported of round-cell sarcoma of the pelvis, which originated either from the periosteum, or the pelvic cellular tissue, or the sheaths of the vessels. The growth of the tumour seemed to be dependent on its own increase; there was no evidence that the cells of the part had become, as it were, infected so as to form structures of a similar nature to those of the tumour, they rather showed retrograde changes. At first the tumour advanced by direct enlargement, but after a time there was perforation of the iliac vein, and a passage of the cells composing the tumour into that vessel. They passed thence through the right heart to the lungs, and through the inferior mesenteric veins to the liver. Having stuck fast in the branches of the pulmonary artery and portal vein respectively, the bits of tumour appeared to take on an independent life, growing by division, and being nourished by

the vasa vasorum. The walls of the vessels were ultimately destroyed by fatty degeneration. From the secondary growths in the lungs, portions were conveyed by the pulmonary veins to the general circulation, and embolic infarctus were produced in the spleen and kidneys.

XXII. The Inhalation of Infective Particles in Respiration (*Falger*).—The power which the lungs seem undoubtedly to possess of resisting the introduction of the poison of many infective diseases, is ascribed by some to the ciliated epithelium which lines the greater part of the air-passages. If, as seems likely, the infective material is in the form of microzoa, which are minute solid particles, then one can understand how the mucus on the surface of the air-passages catching these particles, the cilia should gradually sweep mucus and particles outwards. The present author points out that where the passages are intended to subserve respiration alone, as the nose, larynx, trachea, and bronchi, they are lined with ciliated epithelium. But where a passage is used both for the introduction of food to the stomach and air to the lungs, it has a pavement epithelium, as the mouth and pharynx. In breathing by the mouth the whole surface down to the larynx is covered with flat epithelium, and if the above views are correct, should be more likely to be the seat of development of infective particles. But then the front part of the mouth is being constantly swept by the movements of the tongue, &c., and is, therefore, much less likely to allow of the settlement of these particles. The back part of the mouth, however, and the pharynx have neither ciliated epithelium, nor these advantages. One would, therefore, infer that the palatine arches, the tonsils, the pharynx, certain parts of the larynx, and the vocal cords, would be more frequently affected primarily by infective diseases than other parts of the alimentary and respiratory tracts, especially as most of these are exposed to the current of air, whether inhaled by the mouth or nose. It is to be noted that in many diseases these parts are actually affected at the onset, in scarlet fever, variola, varicella, measles, and Rôtheln; in others, the disease affects these localities throughout its course, in quinsy, suffocative catarrh, and diphtheria. The author suggests that in all infective diseases the air should be disinfected around the patient, so as to prevent their spread. Carbolic acid is that which he most recommends.

PART IV. OCTOBER, 1874.

CONTENTS.—XXIV. On the question of the growth of bone, by J. Wolff, Berlin (Plate, XVII., Fig. 1-3). XXV. Local and general diphtheria, by Dr L. Letzerich (Plate XVIII.) XXVI. On the changes in the peripheral nerves and the spinal cord in chorea minor, by Dr J. Elischer, Budapest (Plate XIX.) XXVII. Remarks on melanæmia and melanosis, by Prof. Arnstein, Kasau. XXVIII. Aphorisms on the pathological anatomy of the central organs of the nervous system, by Dr R. Arndt, Greifswald. XXIX. Smaller communications: 1. Theodor Simon; an obituary, by Dr Burchardt. 2. Case of unusual ossification in a woman, by Dr J. Minkiewicz, Tiflis (Plate XVII., Fig. 4.) 3. German association for public health. Prize essay.

XXIV. Interstitial Growth of Bone (Wolff).—This is chiefly an answer to those who oppose the view that bone increases in size by an interstitial growth. In an appendix he refers to Wegner's paper (see our last number, p. 107). He considers that the apposition and absorption theory is untenable, both on mathematical and anatomical grounds. The architecture being on a fixed plan throughout, and the larger bone being in all its finest trabeculæ an exact magnified copy of the smaller, we should require a simultaneous subversion and reconstruction of the internal architecture of quite an unheard of character. He calls this the theory of continuous architectural revolution.

XXV. Local and General Diphtheria (Letzerich).—The name of this author is familiar to our readers as the chief supporter of the fungus theory of diphtheria. In the present paper he first describes the various forms under which the diphtheria fungus shows itself. The minute appearances of the manifestations are described. There is always, so far as the actual signs of the disease are concerned, a local and a general process, a local and a general diphtheria as he expresses it. The local process may be from the first prominent, or it may be preceded by violent general disturbance. But even in this latter case the fungus is present in great quantity in its usual situations from the outset, even before any exudation has shown itself. The general symptoms are the same whether the local disease has been prominent or not, and he ascribes these to the penetration of the fungus into the blood and the lymphatic vessels. He has found the fungus in the kidneys,

spleen, liver, and heart, and he here describes the appearances presented under the microscope. The fungus produces nutritive disturbances in internal organs, and at the basis of these disturbances is embolic obstruction of the vessels by the fungus. When this occurs there is great development of the fungus, and consequent destruction of the tissue.

XXVII. On Melanæmia following Ague (*Arnstein*).

—The author lives in a malarious district, and during three years has had frequent inspections of cases of malarious fever. It is well known that after ague there is often found pigment in the blood, this condition being called melanæmia. The author, in his cases, did not generally find pigment in the blood contained in the heart and large vessels, and when he did meet with it, it was in cases which died soon (at most twenty-four hours) after the febrile paroxysm. In all cases, however, the capillaries of certain organs contained pigment. The pigment met with in the blood is nearly always contained in the white blood-corpuscles, it is only free in cases where death has very quickly followed the febrile paroxysm. Even then there is already some pigment in the white corpuscles. The organs in which the pigment was chiefly found were the spleen, liver, and medulla of bone. In the spleen he met with it in the neighbourhood of the veins chiefly, but also of the arteries, and to a limited extent in the splenic pulp. In the liver it was always found in, and on the branches of the portal veins and hepatic arteries, but also generally penetrated to the hepatic veins. It was contained in the capillaries chiefly, but also in cells outside the capillaries, and in the interlobular connective tissue. In cases where the pigment was limited to the branches of the portal vein and hepatic artery, the lobules of the liver were as if mapped out by slatey-grey peripheral lines. The medulla of the long bones, as well as the cancellated tissue of the sternum, contained pigment in considerable quantity. It was present chiefly in the tissue of the medulla, but also in the capillaries and transition vessels. In other organs the pigment was rarely met with, and only in cases where the disease was recent. A few round cells containing pigment were met with in one or other of these organs, the brain, kidney, pancreas, intestine. The process in melanæmia probably is that during the acute attack a certain number of red corpuscles are destroyed; the granular pigment thus formed is taken up

by the white blood-corpuscles, and these cells accumulate in the vessels where the circulation is slow. In the spleen and medulla the pigmented corpuscles now pass out of the vessels, in the liver they linger long in the capillaries. As the paroxysms are repeated there is a fresh formation of pigment, a true melanæmia, followed again by its accumulation in these organs, producing a melanosis of them. The author endeavours to reconcile the different opinions existing as to the effect of this pigment on the brain. He believes that it is only in acute cases, where the pigment is very abundant, that it sticks in the capillaries of the brain, and may produce cerebral disturbance. The disease is rarely acute in the author's district, and he has never met with a case of pigmentation of the brain.

VOL. LXII., PART I. NOVEMBER, 1874.

CONTENTS.—I. The influence of the concentration of the blood and the interstitial fluid on the changes of form and place of the white blood-corpuscles, by Dr R. Thoma, Heidelberg. II. Pathological and experimental studies on hypertrophy of the heart, by Dr J. Zielonko, St Petersburg (Plate I.), from the Pathological Institute of Berlin. III. The place of formation of uric acid in the organism, by Dr C. Pawlinoff, Moscow (Plate II.). IV. Investigations on thrombosis. Formation of thrombi, by Dr F. W. Zahn, Strasburg. V. The decomposition of iodide of potassium in the organism, by Prof. C. Binz, Bonn. VI. The temperature of the external meatus under physiological and pathological relations, by Dr E. Mendel, Berlin. VII. Smaller communications: 1. The thermometry of the uterus, by Dr Cohnstein, Berlin.

I. Effects of Concentration of the Fluids on the Movements of Blood-Corpuscles (*Thoma*).—This paper details a number of very nicely executed experiments. The author finds that alteration of the concentration, and especially of the proportion of salts in the blood and fluids of the body, exercises a considerable influence on the movements of the white blood-corpuscles. In concentrated fluids these cells give up all movements, and become round and glancing. In this state they sometimes show on the surface fine hair-like projections. This state of quiescence may continue a whole day, and yet when the fluid is diluted down to its normal degree of concentration the movements are resumed. It was also shown that even when a considerable wound had been made in the tongue of the frog, the

wandering out of the white blood-corpuscles could be prevented by irrigating the wound with a 1½ per cent. solution of common salt. It was reduced by concentration of the blood or increase of its salts. The irrigation produces its effects in two ways. It causes great acceleration of the stream, due to dilatation of the arteries, and this acceleration of the current hinders the accumulation of the white corpuscles on the internal wall of the veins (the wall-zone). But this concentrated solution of salt also directly interferes with the movements of the corpuscles both in the vessels and tissues.

II. Studies on Hypertrophy of the Heart (*Zielonko*).

—The author bases on experiments on animals certain conclusions as to hypertrophy of the heart in the human subject. He produced hypertrophy in frogs and rabbits (with difficulty in rabbits) by constricting the aorta, or irritating the muscular substance by a needle introduced into it. He finds that, especially in the frog, the hypertrophy is chiefly due to an increase of young muscle cells, and that there is also an increase of free nuclei. There was no increase in the size of the full-grown muscle cells, the size of these varying very little under any circumstances, and any variation depending on the age of the animal and its state of nutrition chiefly, but not on any increase of work required. This is true also of the voluntary muscles of the body. In hypertrophy of the heart in the human subject there is probably an enlargement of the young muscle cells, and possibly some new formation of cells. Consistent with this is the fact that enlargement originates chiefly in early or middle life, and generally owes its full development to these periods. When found present in later life, it must always be a question how much is to be referred to early years. Perhaps we have more frequently dilatation than true hypertrophy in late life.

III. Seat of the Formation of Uric Acid (*Pawlinoff*).

—The exact situation of the formation of urea is a very difficult matter to discover, because that substance is exceedingly soluble, and a solution is invisible. In birds and reptiles uric acid and its compounds take the place of urea, and, as these are sparingly soluble, they become visible in the tissues under certain circumstances. In the first place, it is generally impossible to detect the presence of uric acid in the blood of hens fed in the ordinary way. But then it is very

difficult to detect uric acid when present in small quantities in any case. The author added urates to blood in minute quantities, but was unable by the usual methods to recognize their presence; so that our inability to detect them in the blood of ordinary birds is no proof of their absence. The fact that when hens are fed with flesh it is possible to detect uric acid in their blood, shows that it is present in not very minute quantities, and forms a presumption that it is present in ordinary hens, but in quantities too small for detection. It is known that when the ureters of birds or reptiles are ligatured, urates are deposited in the tissues. It has been asserted by some, but denied by others, that after removal of the kidneys a similar deposition occurs. Those who deny that the urates are deposited in the tissues after nephrotomy come naturally to the conclusion that they are formed in the kidneys; and one recent writer points out that after nephrotomy urates are deposited in considerable quantity in the wound. The operation is a difficult one, and animals often succumb. But the author has been successful both in ligaturing the vessels of the kidney, so that the access of blood to these organs was prevented, and also in nephrotomy. In both cases the urates were deposited in the tissues just as in the case of ligature of the ureters, except that none were found in the kidneys. After ligature of the ureters, the deposition occurs first in the kidneys, and primarily in the straight tubules. Next to the kidneys the lymphatics and serous membranes are encrusted, but at the same time the nuclei of the connective tissue corpuscles contain depositions, and there are accumulations around the small arteries and capillaries. After nephrotomy there was a special deposition in the wound, but a similar deposition in a wound made simultaneously in a different part of the body; and in both cases it was probably due to the increased transudation through the vessels in the inflamed wound. From all these facts it is evident that the uric acid is not formed in the kidneys, is only excreted there. Presumably there is a small quantity in the blood of normal birds, which is kept at a minimum by the constant excretion of the kidneys. When the kidneys are removed, or their function destroyed, the quantity increases, and deposition occurs in various tissues. The occurrence of special deposition in wounds is strongly confirmatory of the view that the uric acid comes from the blood. How it should be that the uric acid is excreted by the kidneys at all, and how it is excreted so readily as to leave such minute quantities in the blood,

are questions which are difficult to answer. The pores of the vessels of the kidney may be larger, and the circulation may be specially arranged for excreting uric acid. Then we know that urea and uric acid have great power of permeating and penetrating membranes.

IV. Investigations on Thrombosis (Zahn).—This is an exceedingly interesting and important paper. It is well known that thrombosis often occurs by coagulation of the whole blood. When, for instance, a vessel is ligatured, there is a coagulation of blood at the seat of ligature. Such thrombi are distinguished as red, and have been already very fully investigated. The present author describes white and mixed thrombi, which he asserts originate in quite a different way. His attention was attracted some three years ago to the fact that alterations of the internal coat of blood-vessels may induce an accumulation and adhesion of the white blood-corpuscles, amounting sometimes to a real thrombosis. Wharton Jones had previously observed and recorded such agglomerations in inflammation, but, his attention being absorbed by the process of inflammation, he had not followed out this subject. In the present paper, several series of observations are recorded. When the mesentery of the frog is exposed, the white corpuscles accumulate in the vessels. These agglomerations after a time lose their distinctiveness, the boundaries of the cells disappear, and in a short time the thrombus thus formed looks like finely granular fibrine. The thrombi thus formed are not generally permanent, are after a time torn away and carried forward in the circulation. He observed a similar mode of formation in vessels opened by pricking with a needle, or by incision, and this observation was made on the mesentery of the rabbit as well as the frog. The plug which comes to fill the opening in the vessel is actually composed of white blood-corpuscles, which become by and by finely granular, lose their definition, and afterwards appear cloudy and grey. If portions of the plug are carried through the aperture out into the tissue of the mesentery, the corpuscles may partially resume their distinctiveness, become round, and even begin to shoot out processes. The hæmorrhagic thrombus is, therefore, not due to coagulation of blood, but originates in the manner described. Thrombi of a similar character were produced in a variety of ways. Ligature of vessels in the frog produced curious results. A double ligature did not (as in man) pro-

duce coagulation of the blood, but after the ligature was loosed, and circulation re-established, a white thrombus was formed, either partially or completely obstructing the vessel. The author also observed the mode of formation of mixed thrombi. Under certain circumstances after the formation of a white thrombus, that is, one formed of white corpuscles, the red blood-corpuscles began to wedge themselves into the soft thrombus, till by and by they even concealed the white corpuscles. The author believes that the mode of formation of the white and mixed thrombi is, therefore, fundamentally the same, and that the occurrence is due to some alteration of the internal wall of the vessel. He has endeavoured to show that even in slight injuries there is an alteration of the endothelial lining of the vessels. If the mesentery be twitched with forceps, and the vessels afterwards injected with a solution of nitrate of silver so as to show the endothelial markings, these are seen to be lost at the part twitched.

The author applies these results to thrombosis in man. Here also we have fundamentally two forms of thrombosis. In the case of the white and mixed thrombus, the circulation still persists, the thrombus is originally formed of white blood-corpuscles derived from the passing stream of the blood. In the case of the red thrombus, the circulation has first come to a standstill, and there is a simple coagulation of the entire blood, the stagnation thrombus. The white and mixed are of the same nature, the mixed being formed from the white in the way described above. This kind is induced by alterations in the internal wall of the heart or vessels, and probably a mechanical roughening is sufficient. In infective diseases, and marasmus where white thrombi occasionally form, there is probably a fatty degeneration and desquamation of the endothelium, as has been pointed out by Ponfick. The thrombi formed in the heart and large vessels are white or mixed. The common globular vegetations of the heart are usually white in the ventricles, and mixed in the auricles. The thrombi at the valves of veins are also mixed, and so are the placental thrombi and those following venesection in their earlier stage. Those following embolism of the pulmonary artery are interesting. If the embolus completely fills the vessel so as to obstruct it, then if a thrombus is formed it is red; but if it only partially obstructs, so that the circulation still persists, then the thrombus is a white one.

TRANSACTIONS OF
The Medico-Chirurgical Society.

SESSION 1874-75.

FOURTH MEETING, 4th December, 1874.—Mr John Reid, Vice-President, in the chair.

Dr Joseph Coats read a paper

“ON THE REDNESS AND SWELLING OF INFLAMMATION AS RELATED TO THE CONDITION OF THE BLOOD AND BLOOD-VESSELS.”

The essayist did not attempt to deal with the whole question of Inflammation, but only these two cardinal phenomena so far as related to the state of the blood and blood-vessels. In regard to the redness, it is of course directly caused by the over-filling of the blood-vessels, and in order to this over-filling there is a dilatation of their calibre. Dr Coats referred to the innervation of the blood-vessels in order to explain this dilatation. The arteries, which are the vessels chiefly concerned here, are under normal conditions in a continual state of semi-contraction or tonicity; this depending on the nervous influence transmitted through the vaso-motor nerves. Dilatation of the vessels occurs when, by cutting or paralysing these nerves, the active state of tonicity is no longer kept up. In inflammation such as that which may be induced by an irritant applied to a part under observation, the dilatation seems to be due to a paralysis of the nerves, or, more directly, of the muscular coat of the vessels. The first result of the dilatation of the arteries is acceleration of the blood-current. After a time, however, retardation takes place, while the vessels still remain dilated, and this the essayist ascribed to the acquired adhesiveness of the blood-corpuscles. In reference to this point the experiments of Lister, Saviotti, and Cohnheim were mentioned. The last named author insists on an alteration of the physiological condition of the wall as an essential part of the phenomena of inflammation. The experiments of Lister and Saviotti show that on the one hand the presence of dead matter renders the corpuscles adherent, and on the other that the altered wall of the vessel, acting like dead matter, has a similar effect, rendering the corpuscles adherent both to each other and to the wall of the vessel. This adhesiveness, according to its degree, causes either complete stagnation of the blood or retardation. Such being the condition of the blood within the vessels, the author proceeded to refer to a number of recent observations, from which it appears that not only the fluid but also the solid constituents of the blood pass out of the vessels. The red blood-corpuscles are passive, and when they get out of the vessels they are driven through, the process being designated diapedesis. The white corpuscles are probably active, and

though their passage may be aided by pressure from within, their own movements have also to do with it. Hence we speak of the emigration of the white corpuscles. According to the observations of Cohnheim, the altered state of the wall of the vessels has again an important relation to this extravasation of the blood-corpuscles. Referring to that author's observations on embolism, it appeared that in that condition the stagnation of blood due to the arterial obstruction induces such a change in the wall of the vessel that it is no longer capable of retaining the blood-corpuscles, which are pushed through in great quantities. Similarly in inflammation, the wall being altered—its vitality reduced—the corpuscles escape. The red corpuscles extravasate chiefly from the capillaries, the white from the veins as well, their active movements enabling them to penetrate the thicker wall of these vessels. None of either kind escape from the arteries. The swelling of inflammation in its earlier stages is no doubt in part due to this extravasation of the solid constituents of the blood, but it is still more owing to the exudation of the fluid. It has been common to ascribe this exudation, producing the inflammatory œdema, to the increased pressure within the vessels of the inflamed part, but recent observations render it doubtful on the one hand whether increased pressure in vessels without alteration of the wall is sufficient to cause exudation of the liquor sanguinis, and on the other hand, whether there is increased pressure in the vessels of an inflamed part. We are here again thrown back on the condition of the wall of the vessel to explain the exudation. If the vessels are not able to prevent the solid corpuscles passing through, surely they will be still less able to contain the fluid of the blood. The investigations of Thiersch seem to show that this transudation of fluid is often the preliminary to an actual new formation of capillary vessels. The fluid makes channels for itself, which by widening become vessels according to the requirements of the part. The essayist concluded with the observation that he had not endeavoured to explain the phenomena of inflammation as a whole. The redness was no doubt entirely explainable by the condition of the vessels. The swelling was partly so, but probably also to some extent by changes in the tissues, which subject was not, however, within the scope of the paper.

Dr Eben. Watson said that while the Society were much indebted to Dr Coats for thus bringing the subject before them, yet he must take some general objections to the style in which he had treated it. The style of the paper illustrated well a practice too common in the present day, that of looking entirely to very modern views, and giving the opinions of recent authorities, to the utter neglect and ignoring of those a few years old. In the paper only three authorities were spoken of as contributors to the literature of the subject. It might be said, indeed, that the scope of the paper was limited, and that its object was solely to refer to recent views. But why restrict the references to those three authors, especially when the facts mentioned were old enough? There was hardly anything in the paper which had not been known since a period shortly after the time of John Hunter. The first paper which he (*Dr Watson*) had contributed to that Society was one on inflammation of the laryngeal mucous membrane. In

that paper he had entered very fully into the pathology of the object, and described an experiment to illustrate the *rationale* of the effect produced on the membrane by nitrate of silver, which, indeed, was the subject of the paper. He had, in fact, in that paper, read some fifteen years ago, given the essential facts of the pathology of inflammation as they were given by Dr Coats, and spoken of these facts as being even then well known. That no reference was made, among recent writers, to Sir James Paget's work, was remarkable, and even among the later contributors no mention had been made of the name of Beale. They were not, of course, to look for a bibliography of the subject in such a paper; but it was unfair to select the names of three writers on the subject, to the total ignoring of claims equal, if not much superior, to those of the three writers mentioned. With regard to one of these, he was not aware that Mr Lister had any claim to priority in the discovery of the dilatation of the vessels as produced by the nerves. And he might add that Professor Lister's experiments, illustrative of the changes produced upon the pigment matter in the frog's skin, had been objected to by many physiologists. Without going into the general question of the influence of the nerves upon these cells, he thought that the conclusion which had been drawn was one liable to question. The effect of an irritant upon these cells was quite a different thing. The effect here might be entirely local upon the cells themselves. The motion of the pigment matter was, doubtless, due to the motion in the bioplasm of the cells; Professor Lister's experiment was then quite inconclusive. With regard to Dr Coats's theory of inflammation, if he apprehended his meaning, he appeared to attribute the increased blood current to a force *ab intra*. What effect the last two or three sentences of the paper might have in modifying that view, he was not sure, as there was considerable difficulty in following the argument of such a paper when rapidly read. Still, he had dealt all through the paper with an internal force. This was entirely opposed to the modern physiology of inflammation. According to his understanding of that physiology, inflammation was entirely a local thing. However produced, it ultimately became a centre of attraction—not a centre to which the blood was impelled. The blood was *drawn* not *driven* to the inflamed centre. The drawing power was through the vital force of the bioplasm of the diseased tissue. With regard to the cause of the dilatation, there could be no doubt that it was due to a nervous influence. It must be an influence exercised through the vaso-motor system. It might be a local influence, but it must be connected with, and reflected from, a nervous centre. On that all physiologists were agreed. But to him there appeared to be some confusion or obscurity of statement in Dr Coats's explanation of the phenomena. The difficulty to be explained might be stated thus:—the dilatation of the vessel, with an unvarying *vis a tergo* (viz., the heart), would, if there were no other force, cause a local slowing of the current. Instead of that, the opposite phenomenon was what actually occurred; there was a local increase of the stream. That proved that the efficient force was not a *vis a tergo* but a *vis a fronte*. It was the drawing force of the bioplasm of the inflamed tissue. It was only by looking on inflammation as a process of morbid nutrition, in which the nutritive forces brought into play slightly differed from the normal, that they would get a right view of the subject. Then, with regard to the stasis, which, as Dr Coats had rightly said, was produced in the centre of inflammation, it was clearly brought about by a local cause, which did not affect the blood in its essence. There was no coagulation, as Sir James Paget, after watching a case many days, had testified. What, then, was the cause of the stasis? Undoubtedly there was a change in the relation of the living vessel and the corpuscles within it—

a change which resulted in the stagnation of the white corpuscles. The white corpuscles stagnated before the red corpuscles, for a mechanical reason, viz., there being a certain amount of *drag* in the whole current those corpuscles must stop first which move slowest. The white corpuscles, then, increased locally more than the red in the inflamed part. With respect to the emigration of red blood-corpuscles—their escape, that is, through the uninjured wall—Dr Coats must be aware that the possibility of this was still doubtful. He (Dr W.) was of opinion that they did so escape. It had been shown, experimentally, that particles passed in, and this seemed to show that they might equally pass out. Still there was some doubt about the matter even yet. He had spoken somewhat critically of Dr Coats's paper, but he would add that he highly appreciated its merits. In a theoretical subject in the domain of pathology, there was room for some diversity of opinion, and every reason for giving free expression to different views.

Dr Hector Cameron congratulated Dr Coats on the extremely clear and able way in which he had treated the subject. He confessed that he had sometimes experienced a sensation of confusion of ideas in reading the latest utterances on this and kindred topics, and paying his tribute at the shrine of fashionable physiology. With regard to the effusion of the fluid part of the blood in inflammation, it was now the fashion to say that in the inflamed blood-vessel there existed a tendency to allow the escape of the liquid. But Dr Coats and he, when fellow-students, were taught a different doctrine—one to which Dr Coats had alluded only to condemn, viz., that the tension of the walls of the blood-vessels presenting an obstruction to the return of the blood, some of the fluid part of it escaped by a mechanical law. In a connected system of tubes, if an obstruction existed in one tube the pressure was communicated to the connected system. Was this, then, not a factor in the production of oedema? He thought that Dr Watson had, in his criticism, somewhat antedated the discovery of some of the facts in Dr Coats's paper. Wharton Jones, for example, maintained, not that the white blood-corpuscles adhered of themselves to the walls of the vessel, but that this result was brought about by the heat of the hand, and that when proper precautions were taken this phenomenon did not take place. Dr Watson's explanation of the paralysis of the pigment cells of the frog on the application of an irritant did not account for the paralysis under other circumstances.

Mr John Reid agreed with what Dr Watson had said in respect of the tendency exhibited throughout the paper to ignore the older writers on the subject. In regard to the effusion and redness of inflammation, he had often observed a very violent local inflammation presenting a whitish appearance, a result certainly not due to the aggregation of white corpuscles, which bore to the red corpuscles of the blood a relation of only 1 to 400. This disproportion also appeared to negative the theory that the white corpuscles were the cause of the swelling. He thought that in accounting for the local phenomena of inflammation, Dr Coats had laid no stress upon the non-assimilation which immediately ensued. This was the principal cause of the swelling. As that non-assimilation increased, instead of there being an effusion of the white corpuscles to form a drop of pus, the *debris* resulting from the cessation of assimilative function was retained in the part, and the increased vascular action thereby occasioned was really the cause of the formation of pus. When an abscess was opened there was a certain amount of pus, but generally mixed with blood, which showed that the effusion of blood from the capillaries went hand in hand with the formation of pus.

Dr Joseph Coats, in reply, said that in regard to the three names which

he had unfortunately introduced into his paper, his apology was that they happened to be the names of authors who had written recently on the subject, and their investigations happened to be *apropos* to the purpose he had in view. These authors also wrote with the older investigations before them, and, with their researches fully in view, had brought the questions involved to what appeared to be a solution, at all events, more approximately correct than the older writers. Hence he had not thought it necessary to go farther back into the literature of the subject. Dr Watson in some points appeared to have greatly misapprehended the drift of his remarks. In regard, for instance, to the essentially local character of inflammation, on which that gentleman had insisted, one of the objects of the paper had been to put that view prominently forward. He, therefore, need make no reply to remarks based on a misapprehension of his meaning. He had not asserted for Mr Lister any claim to priority of discovery of the dilatation of the vessels, as being caused by the nerves. He was unable to see how Dr Watson's view in regard to the force causing dilatation being exerted through a nervous centre could harmonise with Cohnheim's experiment, in which that physiologist had completely divided all the nerves. Nor could he admit that the process of diapedesis was still, as Dr Watson averred, of doubtful occurrence. He held that it was well established. With regard to Dr Cameron's question, whether the effusion of the fluid portion of the blood was due to pressure within the vessels, it was possible that to some extent this was the case, but experiment seemed to show that simple increase of pressure was not sufficient to produce effusion. Cohnheim had shown that increase of pressure of arterial blood in the kidney did not produce albuminuria. As to the cases referred to by Mr Reid, in which the inflamed part appeared white, this certainly did not arise from the white corpuscles. Probably the oedema was such as to conceal the vessels. He thanked the Society for the way in which his paper had been received.

FIFTH MEETING, 8th January, 1875.—Dr Morton, President, in the chair.

Dr John McGown, Millport, was admitted a member of the Society.

Dr Jas. W. Anderson read a paper on

THE ETIOLOGY OF HYSTERIA.

Endeavouring to simplify a confessedly difficult subject, he would propose to exclude from the limits of the term hysteria the two following classes of cases—1st, those cases where the patient intentionally deceives (which are in the male always called “malingering”); and, 2nd, those characterized by extreme pain, of which the so-called “*clavus hystericus*” was a type in the opinion of the late Dr Anstie. He (Dr Anderson) believed hysteria to be essentially and primarily dependent on a certain degree of mental incapacity or derangement, and that with this condition sensations which are usually passed by unheeded—sensations “*indifferent*” become sensations “*disagreeable*”—being eagerly caught up, brooded over, and magnified into all the varied ailments peculiar to the disease. He believed, indeed, that those sensations variously described as an uneasiness, numbness, pain, &c., were simply sensations which anyone, to some extent at least, may feel if special attention be directed to particular parts of the body, and that practically we are accustomed to take advantage of this when we endeavour to divert the patient's mind into another channel while we examine the part complained of. With regard to the hysterical fit, he thought that we might

readily account for it being associated with a mental disorder if we accepted the "cerebral theory" of mental disease. Epilepsy, alcoholism, and chorea were almost universally considered to depend on some molecular change in nerve substance, and all furnished phenomena more or less resembling those characterizing the hysterical fit, while the diseases themselves, the first especially, were closely allied to hysteria. He believed that the brain, being diseased, lost an inhibitory influence over the nervous system, illustrating this by the incontrollable convulsive movements of the legs which we occasionally see in paraplegia, as if the inhibitory influence were interrupted at the seat of disease in the spinal column. He then endeavoured to prove what he had hitherto assumed, that hysteria was essentially a mental affection. The power of example in producing the disease, the effect of education, the inutility of local treatment, were among the arguments brought forward; and, further, that if the essential cause were of the nature of some organic change in a particular organ of the body, we should surely have a more definite train of symptoms, and a more particular habit or condition of body associated with, or the result of, the disease. The very reverse of this we know to be the case with regard to the symptoms, and, as for an hysterical diathesis, conditions the very opposite had been given by different writers, simply because there was no one special condition. While claiming for hysteria a mental derangement as the primary cause, Dr A. held on the other hand that the *exciting causes* are practically innumerable. Whatever acted as a shock to the nervous system, anything indeed that attracted the attention of the patient, might be the exciting cause. It was in this way that disorders of the uterus and sexual system generally act as a most powerful exciting cause, for nothing will more readily attract the patient's attention or cause her anxiety and fear.

Dr Gairdner had much sympathy with the main thesis which Dr Anderson had supported, that hysteria consisted in a weakening of the control exercised in health by the mind over the bodily functions. Any difficulty he had in entirely homologating Dr Anderson's views, arose from this, that he was just a little too logical and definite. He must confess that there were some things in this subject which their philosophy even yet appeared inadequate to explain. The idea of hysteria was connected with the hysterical paroxysm, and the peculiar emotional state coincident with it. Dr Anderson's views, he thought, might thus be summarized:—In a normally constituted person, male or female, the brain and the mind (they could not be here dissociated) exercised an insensible rule over the whole organs—a rule not the less potent that it was exerted insensibly: a dominion analogous in its nature to that inhibitory influence exerted by the nervous system over certain functions. When that influence was in any way weakened by some physical or other cause, all those lower functions of the nervous system—those emotional manifestations of nervous action which were usually quiescent—ran riot. If there were emotional centres of the nervous system, these might, like every other kind of nervous centre—in fact, like every thing in the animal organisation—be cultivated by habit, and called into such abnormal activity as to place them beyond the control of the inhibitory action of the governing intelligence. That principle, no doubt, explained

the bulk of hysterical cases, but there were others in which such an etiology was at least doubtful. He had not long ago seen, in consultation, a case of paralysis in a young lady in the country, in which the question arose, Was it bodily or mental? He could not answer the question then, nor could he do so now. He was satisfied that it was not a case of malingering. All the usual circumstances indicative of the hysterical constitution were absent. There had been no disappointment, no emotional shock, no unusual devotion to novel reading. The woman was, in every respect, sensible and intelligent, and mentally free from morbid taint or bias of any kind, such an one, in fact, as a physician would be the last to suspect of showing any hysterical manifestations. Yet the paralysis was real, in respect of the will having only a limited power over the lower limbs. At the same time, from minute investigations, he had been enabled to say that it was not a case of organic paralysis; that it did not arise from disorganisation of the spinal cord. There was no disorder of the bladder, and the uterine organs and functions were perfectly normal. It was a case of what would be called hysterical paralysis, at least of functional, curable paralysis. But scarcely any definition of hysteria would include such a case.

Mr John Reid agreed generally with the views propounded in the paper. He had always considered hysteria as an abnormal mental condition. He had seen cases in which the paroxysm was produced almost by the will of the individual. In one case a young woman wrought herself up into a hysterical ebullition whenever she was crossed or annoyed. A threat that she would be treated by immersion in cold water eventually put an end to the paroxysms. *Mr Reid* also mentioned two cases of hysteria occurring in the same locality, which ultimately both resulted in genuine catalepsy. Hysteria might generally be set down to bad training of girls in youth—to a training which did not provide for the subjection of the emotional nature to the will.

Dr Wm. Macewen said that the manysidedness of hysteria constituted the chief difficulty in investigating its phenomena. It was not difficult to induce voluntarily sensations somewhat akin to those of hysteria. Thus, in order to excite a peculiar feeling in any part of the body, all that was needed was to concentrate the attention fixedly on that organ for some time. Hysterical affections occurred when the control of the brain over the body was weakened. When the dominion of the will was re-established hysteria disappeared. The malady sometimes assumed the form of hydrophobia, and he had himself seen a case in a hotel in Glasgow, in which it simulated that disease. A young man, with a number of others, all from the same city, were returning from an excursion, when he was bitten by a dog. He (*Dr Macewen*) was sent for, and, on entering the room, he found a large table placed in front of the bed, as a precautionary measure, by his companions, who were afraid of being bitten. Rolling back the table he found the patient in a condition which had a resemblance to an attack of tetanus, with his body thrown into the form of an arch. He had the usual horror of water, the mere attempt to get him to swallow a little inducing a spasm. But taking into account the fact the fear of the bite showed that the wound was very superficial, the rapid accession of the attack after the wound, without any period of incubation, and the obvious state of extreme nervousness in which the young man was, he convinced himself that it was a case of hysteria. Putting every one out of the room but a waiter, he told the patient that by a resolute exertion of the will he would be quite able to control the spasms. He sent for a little water, the mention of which threw the patient into another convulsion. Some water was brought; when he attempted to drink a little, it was squirted out. However, he persevered, and after several abortive

efforts, at last got him to drink a little, and gradually the symptoms passed off. He (Dr M.) had lately read the case of a French naturalist who believed himself to be labouring under hydrophobia. He found that the spasms were partly amenable to the control of the will. He resolved to force himself to drink water. After a walk over the hills, in which he broke into a profuse perspiration, he determinedly dragged his limbs to where there was some water, and managed to drink a little. He had tremulous motions of his body next day, but he continually kept himself in exercise, and ultimately recovered. It was noteworthy that sometimes hysterical affections so passed into insanity. He had seen cases where complete want of food for some time had been followed by peculiar feelings and peculiar fancies. When working very hard, and kept up some nights continually, he had himself been brought into such a state that slight noises, which in his normal condition of health would have produced no particular impression, had caused him to start, and in some instances it might only require a prolongation of the fatigue and want of nutrition to have this state made permanent. It was in this way hallucinations often became fixed. With regard to the treatment of hysterical affections, he had seen great good from cold water. Dr Macewen then detailed a case in the male, in which this treatment was ultimately resorted to by the patient himself, with effect; and gave some points in the diagnosis between malingering and hysteria.

Dr Menzies also approved of treatment by cold water. He thought that in some cases hysteria arose from stomachic disorder. He had seen cases in children come on after the eating of apples.

The President said that the discussion had brought out a unanimity of feeling in regard to this subject of the etiology of hysteria. The phenomena of this affection were explained by the non-development or want of cultivation of the power of the brain over the other powers and faculties. It occurred to him that the subjects in which these phenomena were manifested were akin in temperament to those in which anæsthesia gave rise to somewhat similar manifestations. He might also suggest that, in several cases of what was called hysterical paralysis, the application of anæsthesia would be a ready means of diagnosis.

Dr Anderson, in reply, said that he had felt considerable difficulty in investing his ideas on some parts of the subjects—such as that of the assumed inhibitory power of the brain over the lower functions—in precise and adequate language. He had probably even to some extent failed in this, but he was glad to find that his ideas had been perfectly apprehended, in spite of their defective expression. In his attempts to generalise and simplify, he was quite aware that he had possibly left unexplained some outlying facts. His aim had been to distinguish the kind of cases which should be included under the designation hysterical, and for this end to point out that hysteria was primarily and essentially a mental disorder. Any one who wished to be amused at the want of precision with which the word “hysteria” was used, had only to peruse a correspondence on the subject then going on in the *Lancet*. Even in such a book as the last edition of Naylor’s work on “Skin Diseases” he found a chapter headed “hysterical” or feigned diseases, as if the two terms were convertible or synonymous. If his paper had in any measure contributed to greater accuracy in the application of the term, a more certain appreciation of the strictly mental character of the condition, it had served its end.

Glasgow Pathological and Clinical Society.

SESSION, 1874-75.

FIFTH MEETING, January 12th, 1875.

Dr Knox showed the brain of a horse from a case of amaurosis affecting both eyes. The lesions were a sarcomatous enlargement of the pituitary body and SARCOMATOUS TUMOURS on the choroid plexuses. The pituitary body was like a round ball, measuring exactly one inch in diameter. It had exerted considerable pressure upwards on the third ventricle, optic tracts and commissure, and outwards upon the carotid arteries and venous sinuses, having been thus without doubt the chief cause of the symptoms observed during life. On section it was seen to be somewhat irregularly lobed, with the lobes separated by loose connective tissue. The substance of the lobes was greyish in colour and brittle; ecchymosis had taken place to a considerable extent in some of them. Microscopic examination showed that the enlargement of the gland was due to a hyperplasia of the normal gland tissue; the cells, however, were larger, contained one or more large nuclei, and were either singly, or in groups enclosed in the meshes of the retiform connective tissue. This last was also in marked abundance. The tumours on the choroid plexuses were small and oval in shape; that on the right was rather larger than a common bean, that on the left was somewhat smaller. On section the interior of the tumours consisted almost entirely of small angular masses of cholesterine, somewhat like miniature gall stones, and embedded in a loose reticulum of connective tissue. The outer part of the tumours was firm, and under the microscope was seen to consist of an adenoid or lymphatic tissue, similar to that found in the pituitary body. The tumours were thus lympho-sarcomata, and *Dr Knox* was inclined to believe that they were of constitutional origin, being probably connected with disease of the lymphatic system.

Dr Leishman wished to know what symptoms had afforded grounds for the diagnosis of tumour in the choroid plexus, as these might have a value in the human subject.

Dr Joseph Coats observed that, in his experience, small growths on the choroid plexus were of comparatively frequent occurrence in the human brain. These growths were mostly either cysts or psammomata, and appeared to produce no symptoms whatever, even when they reached as large a size as the larger of those in *Dr Knox's* case. He felt inclined to consider the tumours in that case as simple coincidences.

Dr Alexander Robertson agreed that such growths in the choroid plexus were very frequent in the human brain in all sorts of cases.

Dr Knox said the history was very imperfect; but he presumed the

surgeon had diagnosed the choroid plexus as the seat of the tumour, simply on account of their frequency in this situation, and their extreme rarity anywhere else. Such tumours frequently existed in the brain of the horse, also, apart from any symptoms.

Dr David Foulis showed an instrument which he had devised for fixing ESMARCH'S ELASTIC BAND. This was described by him in a short paper published in the January number of this *Journal* (p. 50 of the present volume). *Dr Foulis* showed the applications of this tourniquet on a patient (for amputation at the shoulder-joint, upper part of the thigh, &c.). He said that this catch allowed a relaxation of the pressure to be made gradually, so as to guide the surgeon in the tying of the smaller arteries cut at an amputation; by putting one of the turns on loosely and the other more tightly, the latter could be removed at the desire of the surgeon in the picking up of the arteries. Various members tested the efficiency of the catch, and expressed their satisfaction with its simplicity and freedom from slipping.

Dr Alexander Patterson thought such a portable tourniquet, so efficient, and so easily and rapidly applied, would form a valuable instrument for military practice on the field.

Dr Patterson exhibited a small oblong tumour (FALSE NEUROMA), which he had removed from the median nerve in the upper arm of a patient who had suffered from partial paralysis of the fore-arm for eight years. The growth was supposed to be the result of an injury. In removing it, the tumour was found quite distinct from the surrounding tissues, with the exception of the nerve, which ran into it.

Dr Reid exhibited sections of this tumour under the microscope. He said that, on making a longitudinal section, traces of original fasciculi of the nerve substance were observed running through the centre of the tumour. This consisted of soft, slightly elastic tissue with a tendency to nodulation at the surface. The microscopic section through the central part showed traces of the fasciculi of the nerve, principally at the smaller extremity of the tumour, which seemed the most recent, and formed a reticulation, the interstices of which were occupied by loose connective tissue containing abundance of small round cells. At the other extremity, the nervous tissue appeared to be entirely replaced by these cells. The general substance of the tumour was made up of these cells retained in a fine stroma. From the large size of the arteries embedded in the tumour, it must have contained much blood during life. The tumour, although probably of traumatic origin, was evidently not composed of simple granulation tissue, as chronic acid did not harden it as it does this tissue. The cells were, moreover, smaller than usual granulation cells, slightly oval and highly refracting; they resembled the ordinary granules of the neuroglia in size and shape. He thought the tumour a sarcoma or a gliosarcoma.

Dr Joseph Coats remarked that this appeared to be a case of false neu-

roma. The tumour was not essentially composed of nerve fibres as in certain true neuromata which he had seen. The history of the case and the predominance of round cells in the growth suggested an inflammatory origin, but from the cursory examination Dr Coats was not inclined to venture an opinion as to its exact classification.

Dr Patterson showed a preparation from a fatal case of EXTRAVASATION OF URINE. There was a stricture of the urethra, and an impacted stone just behind it.

Dr Hector C. Cameron showed some urinary calculi.

SIXTH MEETING, January 26th, 1875.

Dr Maclaren showed a specimen like a piece of the skin of a raisin, said to have been passed *per urethram* by a man under his care at the hospital, who was supposed to have a hydatid tumour of the liver. This had been tapped twice, and about a hundred ounces of chocolate-and-cream-like fluid removed. No hooklets were found in this fluid. Inflammatory symptoms subsequently occurred, and three weeks after the second tapping the patient passed half a chamber-potful of dark fluid, similar to that removed from the tumour; the urethra had become obstructed, it was said, for a time, and after this was overcome, the patient produced the specimen shown, as the cause of the obstruction. Since then the grave symptoms had somewhat improved. Dr Maclaren did not think the man guilty of imposition, but he had been eating yellow grapes, and possibly this might prove to be the skin of one. Dr Joseph Coats and Dr Thomas Reid were appointed to examine the shred.

[At the next meeting they reported that the structure was clearly vegetable; the cells were larger than animal cells, and by the iodine reaction starch was plainly made out.]

Dr Hector Cameron showed a patient from whose breast he had removed three SARCOMATOUS TUMOURS, formerly shown to the Society. A fourth had now grown, and it seemed much more adherent to the subjacent tissues than the former ones.

Dr Alexander Robertson showed the BRAIN OF AN IDIOT, in which the corpus callosum was absent. A committee was appointed to report on the case at a subsequent meeting.

Dr George Buchanan showed a Zwank's PESSARY crusted over with phosphates, which had remained in the vagina for five years, part of the instrument projecting from the vulva. Urine passed down by the side of the instrument, and on its being removed, without much trouble, a large vesico-vaginal fistula was found.

Dr Gairdner said he made a *post-mortem* examination in 1851 in a case with long standing uterine symptoms, and in which death had resulted from acute pulmonary tuberculosis. In the lower part of the abdomen there were the appearances of peritonitis, partly perhaps tubercular, with adhesions and matting together of the pelvic organs; and at the fundus uteri something hard was found. A "stem-pessary" was found at the top

of the vagina, the stem being imbedded in the wall of the uterus just under the peritoneum. This had evidently given rise to chronic peritonitis, &c., and the pulmonary tuberculosis was no doubt secondary to the pelvic mischief. The case had been diagnosed during life as one of uterine fibroid, but the verdict after the *post-mortem* examination should have been, "Died of pessary."

Dr George Buchanan thought that in elderly women, without discharges of any kind from the womb, more or less complete occlusion of the vagina by operation was a procedure that should be more often carried out in bad cases of procidentia uteri than it was, as affording a better remedy than the use of pessaries.

Dr Finlayson presented the boy with HYPERÆSTHESIA of the fingers, shown this time last year (see *Journal*, July, 1874). He had since been treated by galvanism, and might now be said to be quite well. The treatment was begun at the end of January, and continued till the middle or end of March. A descending current from about twenty elements of Weiss' battery was applied two or three times a week at first, and latterly less frequently. The current was passed steadily from the spine to the hand immersed in salt water, or from the spine to the nerve trunk, or from the nerve trunk to the hand, about ten minutes for each segment, the whole *sance* occupying twenty or thirty minutes. After the first two or three applications, in which the current was much more acutely felt in the affected fingers than in the others, a very great improvement could be noticed; this special sensitiveness to the current diminished and passed away, and ultimately the degree of hyperæsthesia became so slight that further treatment seemed superfluous. A fortnight ago the state of sensation was examined, the affected fingers bore irritation nearly as well as the others. Their tactile sensibility, which had been slightly impaired, was now as nearly as possible normal, and there was no tenderness over the spine or over the nerve. *Dr Finlayson* thought that while part of the recovery might be due to the boy's leaving off his manual occupation, and to the effect of time, the rapid improvement, after a month's stationary condition under belladonna plasters, and before the electrical treatment was begun, pointed clearly to the beneficial action of galvanism in this case, which, when last shown to the Society, had a somewhat threatening aspect.

Dr Cameron said the best evidence of the cure was the ability of the boy now to use his hand as well as ever.

Dr Gairdner thought the recovery of the tactile sensibility was the most satisfactory sign of cure. Hyperæsthesia was a misnomer, it should be paræsthesia, painful sensations with diminished tactile sensibility.

Dr Robertson showed the BRAIN OF AN APHASIC, from a patient who had been for a long period under observation. The case was remitted to a committee for report.

Dr Robertson showed a specimen obtained from an infant, aged nineteen months, affected with CROUP. The illness was stated to have been altogether of five days' duration. When first seen by him, a few hours before

death, the state of the chest, and general exhaustion, precluded any prospect of relief by operation. The specimen showed was a complete cast of both larynx and trachea. The false membrane did not extend higher than the rima glottidis, but below it was prolonged into both bronchi, though in them it was thinner and less complete. Its connection with the mucous membrane was nowhere intimate, and at some parts it had quite separated. Above the vocal cords, and on the under surface of the epiglottis, the membrane was thickened, but there was no morbid structure; nor was there any diphtheritic exudation on the tonsils, pharynx, or parts in their neighbourhood.

Dr Alex. Robertson also showed an AORTIC ANEURISM PROTRUDING IN RIGHT AURICLE. The heart was very much enlarged. Just beyond the valves there was an opening in the aorta, about $\frac{3}{4}$ inch in diameter, leading into a cavity in the substance of the heart, large enough to hold a large plum. Its wall projected in the right auricle, and probably encroached on it considerably, when distended with blood. The patient was a woman, age 45. Death was immediately due to general dropsy and serous effusion into the pleural cavities. The most prominent symptoms were increased dulness on percussion in the cardiac region, and a fusing of the two sounds at the base into a loud murmur. The case was published, during the patient's life-time, in another connection, (*British Medical Journal*, April 18th, 1874,) namely, epilepsy, preceded by coloured vision, and followed by a partial loss of power to recognise the special colour, and also by temporary aphasia and hemiplegia. No distinct pathological condition was found in any part of the brain.

Dr Joseph Coats showed a specimen of PERICARDITIS in which, with very marked redness of the membrane, there was a layer of soft lymph on the surface, which had the usual shaggy appearance. In the same case there was acute endocarditis affecting the aortic valve chiefly, one of the semi-lunar folds of which was perforated by a round aperture, about one-eighth of an inch in diameter.

Dr Joseph Coats also showed a case of ANEURISM OF THE AORTA, PERFORATING INTO THE RIGHT VENTRICLE. The aneurism was situated just above the aortic valve, and consisted of a shallow pouch, which projected into the right ventricle, just below the pulmonary valve, and between two of its semi-lunar folds. At the most prominent point of this projection there was a minute perforation. Alongside this aneurism there was another shallow pouch which projected externally, and the aortic arch, as a whole, was very atheromatous.

THE
GLASGOW & WEST OF SCOTLAND MEDICAL ASSOCIATION.

ANNUAL MEETING.

The Annual Meeting of the Members of the Association, as convened by printed circular, was held in the Faculty Hall, 242 St Vincent Street, on February 1st, at 4 p.m. The President, Professor Allen Thomson, occupied the chair.

The General Business Secretary, Dr Tennent, read

THE ANNUAL REPORT OF THE BUSINESS COMMITTEE.

"At the last Annual Meeting the Association was reported to have 275 Members. During the past year 14 new Members have been added to the Association. Of the old members, however, three have intimated their resignation of Membership; while six have died during the year, viz., Drs Steven, Lyon, Howat, and St Clair Gray, of Glasgow; Dr Macfie Smith, of Ibrox, and Dr Richard, of Dumbarton. The Membership, therefore, now numbers 280, being an increase of five on that reported at the last Annual Meeting. Although this result indicates that the Association is still in a satisfactory condition, the Committee would urge upon the Members the propriety of their endeavouring to gain new adherents to the Association; as from death, resignation, and non-payment of subscriptions, there is, every year, a certain number removed from the list. The Committee desire to express their profound regret of the death of Dr Steven, who, for upwards of five years, discharged the duties of Treasurer, and had done so much towards promoting the success of the Association. At the last meeting of the Business Committee, the President (Professor Allen Thomson) intimated that he had received a communication from Dr Russell, expressing his desire to be relieved of the duties of Editorial Secretary. The Committee then unanimously agreed to recommend at the Annual Meeting of the Association that Mr H. E. Clark, who, during the past year, ably assisted Dr Russell, should be appointed Editorial Secretary."

The Treasurer, Dr Wilson, then read his

FINANCIAL REPORT OF THE PAST YEAR.

"Owing to the unusual delay of country members in remitting their subscriptions, the payment of certain accounts against the Association had to be postponed, in order to leave a sufficient sum in hand—chiefly of Messrs Dunn & Wright, for the last two Numbers of the *Journal*, £79 18s 11d. But circulars issued towards the end of January, 100 in number, have already, along with other remittances, produced £42, which, with the balance at the end of the year of £148 12s 5d (in all £190 12s 5d), has enabled the Treasurer to pay off all these claims, and leave a balance in his hands at this date (February 1st) of £102 1s 6d. Part of these subscriptions, no doubt, are applicable to the year 1875, yet if the whole Circulars be responded to,

and other out-standing sums due to the Association be paid, ample funds will be obtained at an earlier part of the year than usual. The fee of £5 5s hitherto paid by this Association for reporting the proceedings of the Medico-Chirurgical Society, is in future to be borne by that Society itself. Taking a moderate view of the past and prospective finances of the Association as applicable to 1874, there is an advance for that year beyond the former year of about £10."

The Report and Balance Sheet of the Treasurer were examined and found correct by Drs Scott Orr and Finlayson.

The Reports having been approved of, the election of Office-Bearers for 1875 was then proceeded with, and the following were elected :—

President—Prof. ALLEN THOMSON.

Vice-Presidents—Drs EBEN. WATSON and R. SCOTT ORR.

Treasurer—Dr JOHN WILSON, 252 West George Street.

Editorial Secretary—Mr H. E. CLARK, 9 Elmbank Street.

General Business Secretary—Dr G. P. TENNENT, 120 Bath Street.

Business Committee.

PRESIDENT.	Dr GAIRDNER.
VICE-PRESIDENTS.	Dr J. B. COWAN.
TREASURER.	Dr FINLAYSON.
SECRETARIES.	Dr RUSSELL.
Dr JOSEPH COATS.	Dr PERRY.
Dr ALEXANDER ROBERTSON.	Dr A. WOOD SMITH.

BOOKS, PAMPHLETS, ETC., RECEIVED.

A Manual of Hygiene, Public and Private, and Compendium of Sanitary Laws. By Charles A. Cameron, M.D., &c., &c., Medical Officer of Health for Dublin. pp. 476. Dublin: Hodges, Foster & Co. London: Bailliere, Tindall & Cox. 1874.

Etude sur L'Angiome Simple Sous-cutané Circonscrit; suivie de quelques remarques sur les angiomes circonscrit de l'orbite. Par le Dr Charles Monod. Paris: J. B. Bailliere et Fils. 1873.

Du Massage des Frictions et Manipulations appliqués a la guérison de quelques Maladies. Par N. Laisné, Professeur de Gymnastique, Massages et Frictions, Appliqués a la Médecine. Paris: J. B. Bailliere et Fils. 1868.

A Treatise on Cutaneous Medicine and Diseases of the Skin. By H. S. Pardon, M.D., Physician to Belfast General Hospital, &c., &c. London: Bailliere, Tindall & Cox. 1875.

On Spermatorrhœa, its Pathology, Results, and Complications. By J. L. Milton, Surgeon to St John's Hospital, for Diseases of the Skin. Tenth Edition. London: Robert Hardwick. 1875.

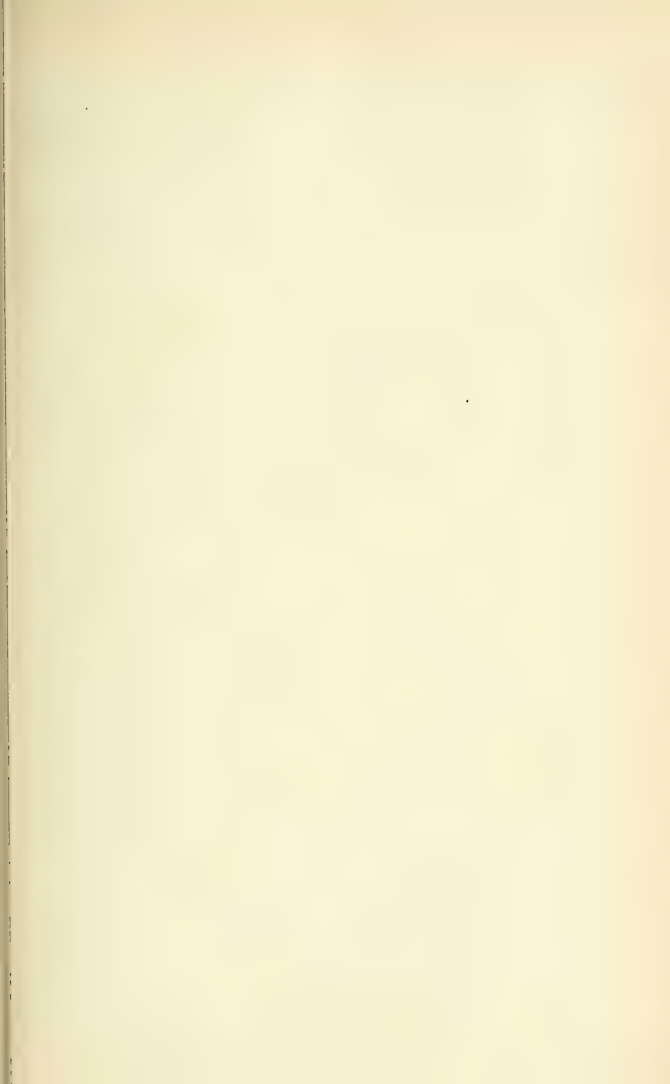


Fig. 1

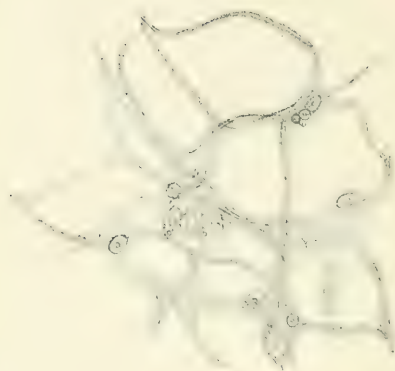


Fig. 2



Fig. 3



DESCRIPTION OF PLATE.

FIG. 1.

Sketch from the omentum of Guinea-pig H, shewing the bars of the network thickened, with granular margins, and with incipient miliary tubercles.

FIG. 2.

Pendulous mass hanging from peritoneum of Guinea-pig D.

FIG. 3.

Sketch from omentum of Guinea-pig I, showing a miliary tubercle. In some of the cells particles of cinnabar are seen in the form of black dots.

THE
GLASGOW MEDICAL JOURNAL.

July, 1875.

Original Articles.

I.—A STUDY OF TUBERCLE. THESIS FOR DEGREE OF M.D. 1875.

By DAVID FOULIS, M.D., *Pathologist to the Glasgow Royal Infirmary.*

FROM the time of Hippocrates (B.C. 400) down to the time of Franciscus Deleboe Sylvius (A.D. 1650),* *i.e.*, for more than 2000 years of recorded medical history, there were prevalent views of the nature of diseases of the lungs, which during that period hardly altered from those advanced by Hippocrates. Phthisis was to the practitioner of those days a disease following on pneumonia, pleurisy, hemorrhage, or abscess; and it was essentially an ulceration of the lung tissue, diffusely or circumscribedly suppurative. Tubercular phthisis, as we now know it, was not appreciated until *post-mortem* examination and independent research awoke to life; and then began the discussion on the nature of the Miliary Tubercle, which has lasted down to our own day.

It was not long before the similarity of the morbid products in the lymphatic glands to those in the lung tissue attracted notice, and the earlier observers (Sylvius, Bonnet, Morton,) developed the theory that the miliary tubercle of the lung was a glandular hyperplasia, an overgrowth of a minute rudimentary gland structure, which they assumed to be present in the normal lung. In Morgagni's day

* See Waldenburg. *Die Tuberculose, die Lungenschwindsucht und Scrofulose.* Berlin. 1869.

(A.D. 1771) this notion had gained a firm footing, for we find him alluding to it as a question which he does not undertake to decide; but at the end of last century it appears to have fallen into discredit—to be revived later on, like so many medical theories—Baillie in particular* negativizing, firstly, the origin of tubercle from glandular elements in the lungs, and secondly, the very existence of such glandular elements. He held to the view that tubercle has its seat in the interstitial tissue, that it is a deposit of serofulous matter, and that miliary and diffused, or, as we now say, infiltrated tubercle, are the same in kind.† Theory, however, was too active at this time for the general acceptance of any one view, and opinion was balanced as to the intra- or extra-alveolar seat of tubercle—Vetter of Vienna, in 1803, concluding in favour of the former view. The questions of the relations of miliary to diffused tubercle, and the relation of both to serofulous matter, were freely discussed, while this region of medicine was made the battle ground where the rival schools of inflammatory and non-inflammatory theorists fought out their quarrel.‡ The inevitable consequence of this was that terms and theories were bandied about in such profusion that at the present day the student finds himself in an endless labyrinth; and if, by chance, he emerges to anything like a clear idea of the nature of the

* Matthew Baillie. *The Morbid Anatomy of some of the most important parts of the human body.* London, 1793. P. 46: "There is no morbid appearance so common in the lungs as that of tubercles. These consist of rounded, firm, white bodies, interspersed through their substance. They are, I believe, formed in the cellular structure which connects the air cells of the lungs together, and are not a morbid affection of the glands, as has been frequently imagined. There is no glandular structure in the cellular connecting membrane of the lungs; and on the inside of the branches of the trachea, where there are follicles, tubercles have never been seen. They are at first very small, being not larger than the heads of very small pins, and in this case are frequently accumulated in small clusters. The smaller tubercles of a cluster probably grow together, and form one larger tubercle," etc.

† Baillie, *Op. cit.* p. 49: "In cutting into the lungs, a considerable portion of their structure sometimes appears to be changed into a whitish, soft matter, somewhat intermediate between a solid and a fluid, like a serofulous gland just beginning to suppurate. This appearance, I believe, is produced by serofulous matter being deposited in the cellular substance of a certain portion of the lungs, and advancing towards suppuration. It seems to be the same matter with that of the tubercle, but only diffused uniformly over a considerable portion of the lungs, while the tubercle is circumscribed."

‡ Consult Waldenburg, *op. cit.* for details of this discussion.

tubercle, his mind is yet encircled with clouds of doubt and uncertainty, arising in part from the difficult nature of the subject itself, but also largely due to the confused state of the literature.

The inquiry is complicated at the very outset by the vital question as to the limitation of the term tubercle to the minute miliary granulations. Many of the leading writers have adopted this nomenclature, but it is by no means exclusively accepted, and authors are not wanting who exclude the miliary granulation altogether from the disease "Tubercle." (Bayle, Lorrain and Robin, Empis.) It is clear that in many instances the application of the term tubercle will be a mere question of extent or size of the morbid product, unless there be some peculiar element or mode of construction in the minute grey granulations which will enable us to class them separately. If there be not such, then how small and how large may a tubercle be? * This question must be answered, I think, not by the micrometer, but by a reasonable consideration of the mode of growth and the internal structure of the tubercle itself; and this can best be done by direct observation of nature.

Experiment† 1.—Oct. 22, 1873. A turbid fluid of a brick-red colour was obtained by rubbing up small pieces of a fresh tubercular lung with water; of this 0.32 c.c. were injected into the peritoneal cavity of a guinea-pig A, the needle of the syringe being inserted a little above the umbilicus and to the left of the middle line. Microscopic examination of the fluid showed it to contain debris, bacteria, blood cells, and quantities of cells varying from the pus-cell to the large polynucleated cells, all intermediate grades being represented. A similar quantity of the same fluid was injected in the same way into a guinea-pig

* Wm. Addison. On Healthy and Diseased Structure. London: 1849. P. 51. "From my researches, tubercles appear to be present in the lungs more frequently than is generally imagined. I have examined with a lens many apparently healthy lungs, and have found them more or less abundantly in one-third. In these instances the tubercles escape notice, unless searched for in very thin sections, first macerated in water to remove the air-bubbles, and then gently extended upon a dark surface."

† The experiments and notes which are now given were made in Stricker's Laboratory, in Vienna, in the winter of 1873, and were to a large extent founded on well-known researches by others, the actual results of which, however, I desired to see for myself.

B. On Nov. 17th, 1873, *A* was killed by a blow on the neck, and on the abdomen being opened, the great omentum was found covered with minute white dots. The peritoneum over the diaphragm, liver, and spleen also presented small whitish-yellow points. The other organs presented nothing remarkable. The fresh specimens of the white dots were found to be made up of cells of varying shape and size, with granular contents and distinct nuclei, the larger cells containing more than one. Kept over night (in moist chamber) the masses were seen to be composed of lymphoid cells, the larger cells having apparently broken up, leaving the large nuclei free. On the surface of the parts of the peritoneum treated with nitrate of silver solution (1-200), the endothelial cells covering the dots, or let us at once say the tubercles,* were found to be of very different shape to those on the other parts of the peritoneum. Other parts of the tissues treated in various ways gave negative results. The examination of the peritoneum is best done in the fresh state.

Nov. 25. *B* killed. No trace of tubercles anywhere; an abscess, containing thick white pus, at the seat of puncture. The pus made up of shrivelled pus cells. In this case a merely local irritation had resulted, the injection not having reached the peritoneum.

Experiment 2.—Nov. 3, 1873. Two guinea-pigs, *C* 310 grms. wt., and *D* 230 grms. wt., were treated in the same way as in the first experiment. Nov. 20, 1873. *D* found dead, greatly emaciated. The whole peritoneum strewed with fine white tubercles; the glands of the mesentery swollen; the other serous membranes not affected. Examined fresh (in $\frac{1}{2}$ p.c. sodium chloride solution) the tubercles were seen to be composed of masses of cells of various shapes. Where the peritoneal membrane happened to be folded, the layer of cells at the edge of the fold was seen thickened, and here and there bunches of large unequal cells hung from the face of the peritoneum like sea-weed from a rock.† (See Fig. 2.) Nov. 25, 1873. *C*

* Authors and experimenters on this subject agree that the white dots produced in this way are real tubercles. (See Waldenburg, Villemin, Wilson Fox, &c.)

† See also E. Klein. *The Anatomy of the Lymphatic System.* Part I. *The Serous Membranes.* London. 1873. P. 65 et seq.

killed ; wt. 325 grammes. The great omentum and peritoneum generally is covered with very small opaque corpuscles, looking like dispersed fat particles, with here and there larger nodules. The peritoneal cavity full of a reddish turbid fluid ; the other serous membranes natural. With the microscope the endothelial cells are on some places of the peritoneum quite plainly thickened and granular, their connecting substance clearly visible. At other places the cells are granular, more separated, more diverse in shape (caudate, spindle, circular, oval, &c.) Close by there is a tubercle, the edges of which are plainly composed of such cells. Looking through the whole tubercle, similar large altered endothelium cells are seen, together with much granular matter, in which here and there a cell outline is visible. Where the peritoneum is folded the endothelium cells are seen bulging out in their centre and thinning away to the edges, so that there can be no doubt that the endothelium is thickened and granulated. At another place a thin oblong layer of form elements lying on the surface of the peritoneum ; most of the form elements are of the size of common pus corpuscles, spherical, rather flattened where they touch each other ; mingled with these, smaller corpuscles, red blood corpuscles, and indeterminate pigment masses. The net-work of the omentum (in $\frac{1}{2}$ p.c. sol. Na. Cl. fresh) shows the wavy lines of the ground substance. The fibres look granulated ; here and there a nucleus is to be seen ; and the fibres of the net-work seem overlaid with granular matter, elevated here and there into a prominence in which a nucleus is embedded. There seems here no doubt that the changes are seated in the endothelial cells and ground substance. At another point, a vein and capillaries full of red and white corpuscles are padded outside with leucocytes, some of which are apparently imbedded in the tissue, and here and there a corpuscle is seen which seems to protrude through the wall of the vessel. Here the endothelium is not visible ; it gives the impression of being merely the results of cell emigration, unless it be a case of invagination of a blood-vessel by a lymphatic.*

Experiment 3.—Nov. 4th, 1873. Two rabbits *E* (wt.

* See Klein, op. cit.

114 grms.) and *F* (wt. 147 grms.) were treated as in the foregoing experiments, only 0.16 c.c. of the fluid being injected. Nov. 5th. *E* found dead. Nothing abnormal. Nov. 6th. *F* found dead. Nothing abnormal.

Experiment 4.—Dec. 6th, 1873. A rabbit *G* was treated thus:—A mixture of finely-powdered cork with water was blown into the trachea through a wound in the neck. Dec. 8th. *G* found dead yesterday. Lungs hyperæmic; nothing otherwise notable.

Experiment 5.—Dec. 9th, 1873. Into the peritoneal cavity of a guinea-pig *H* were injected 12 drops of a serosanguineous fluid from the body of a healthy rabbit. Dec. 30th, 1873. *H* killed. In the abdominal cavity are some drops of a reddish fluid, in which the microscope shows red blood corpuscles along with numerous white corpuscles and cells larger than them. The white corpuscles are in some cases attached together in groups; one such group contained more than 100 such corpuscles, like a small tubercle. The omentum and peritoneum generally dotted over with minute tubercles. Under the microscope (*See Fig 1.*) the omental endothelium is seen in profile clearer than usual, thickened and granular, forming a fringe or edging to the individual bars of the omental grating, with the same localised rounded prominences containing large nuclei (as in *C*). The whole aspect of the specimen points to the growth of the endothelium. In some places the meshes of the network are filled with a granular mass, in which lie imbedded a number of nuclei of various sizes—nuclei of the same aspect as those on the bars. Here we seem to have the very rudiments or beginnings of the forming tubercle. The lungs in this case were pale, with many areas of extravasion and pigmented spots. They were injected with cacao-butter, and hardened in alcohol. Sections made on January 2nd, 1874, showed a pigmented and catarrhal state of the lining cells of the alveoli.

Experiment 6.—Dec. 9th, 1873. About 12 drops of a mixture of cinnabar and water injected into peritoneal cavity of guinea-pig *I*. January 3rd, 1874. *I* killed. At

the place of injection a little of the cinnabar still seen; the spot otherwise normal. The omentum coloured red, especially along the lines of accumulation of fat. The microscope shows the same changes as in *H*; and pigment granules are seen in many of the endothelial cells. Adherent to the upper and under surfaces of the middle part of the liver there is a thick reddish exudation, in which the microscope shows fibrin, blood corpuscles, and masses of caudate cells of many shapes, stuck together in clusters and strings. In some places it seems as if the cells were undergoing transformation into fibres. In some parts of the omentum the clumps of cells have reached a considerable size, and the cells contain so much pigment as to give the clump a red colour to the naked eye. From some clumps there are seen with the microscope processes composed of cells and granular matter shooting out along the thickened bars of the omental network, and gradually losing themselves in the granular covering of the bars (*See Fig. 3*). The lungs pale; here and there areas of extravasation. Hardened in chromic acid and alcohol, the alveolar epithelium in and around the hyperæmic and hæmorrhagic areas is found swollen; some alveoli are compressed.

Experiment 7.—Dec. 9th, 1873. A rabbit *K* treated as *G* was (cork powder and water into trachea). Dec. 10th. *K* decapitated. Lungs pale, and strewn with small red areas. In the juice scraped from the cut surface there are found, besides blood cells, altered epithelial cells of many shapes and sizes, some very large. The cell body is usually darkly granular, and the nuclei seem in places to be undergoing proliferation. In some cells of medium size 2 or 3 nuclei can be seen. In the largest as many as 6 or 7 strongly granular nuclear bodies are visible, a few of them containing nucleoli. Besides the above, the field is covered with granular matter and free nuclei. As compared with the juice scraped from cut surface of lung of another rabbit (healthy), the intensity of epithelial change and nuclear increase are very marked.

Experiment 8.—Dec. 11th, 1873. About 12 drops of a red-

dish frothy fluid obtained by rubbing up a tubercular lung in a mortar was thrown into the right lung of a rabbit *L* with a syringe, the needle of which was pushed through the wall of chest at a point where the percussion was resonant. The fluid contained air bubbles, granular matter, vibrating granules, form elements of various sorts, and vibriones. Dec. 13th. *L* killed (decapitated). The cavity of the right pleura full of a reddish turbid fluid; the pleural surface coated with a greyish coagulated layer, in which the microscope shows white and red blood cells, cells like young squamous endothelium, cells of the size of ordinary squamous endothelium composed of shining granules, fibrillated fibrin. In the right lung an area about the size of half a cherry, the central part of which is dark red and the rind quite white. This area is found to contain debris of lung elements, bacteria, and vibrating granules. In the fluid from the pleural cavity and the blood of the animal, bacteria could not be detected. A few hæmorrhagic areas in the rest of right lung, and about the middle of its outer surface a small warty prominence; the left pleura quite smooth and clean. On the surface of left lung a few areas of extravasation, which on section are seen to extend into the substance of the lung.

Experiment 9.—Dec. 11th, 1873. A guinea pig *M* treated in the same way as *L*. Dec. 12th. *M* decapitated. Cavity of right pleura contained a quantity of reddish fluid; surface of lung coated with soft grey material. In the pleural fluid white cells, singly and in groups, floating, with a few red blood cells; the white cells show amœboid movements; in the fluid innumerable small clear rod-bacteria. Left pleura and surface of left lung similarly affected with right, but to a less degree.

Experiments 10 and 11 were repetitions of the two last, but were interfered with by unforeseen circumstances. Rabbit *N* (24 hours after injection of reddish fluid into right lung), extensive hyperæmia of right lung; pleurisy of left side. Rabbit *O* (48 hours after similar injection), severe pleurisy of right side, less marked on left; both lungs hyperæmic.

Pausing here for a moment, let us note the direction in which these facts lead us. We find that by placing the peritoneal surface in contact with a fluid containing in suspension minute particles (cells, debris, particles of cinnabar, etc.), we produce over the peritoneum a diffuse eruption of small white dots, exactly simulating to the eye the miliary tubercle, within three weeks after first contact. We find that these dots are essentially composed of rapidly developed cells, which are derived from the endothelium of the peritoneum. There are no blood vessels to be seen in them. The cells composing them are of various sizes; and where the nature of the irritant particles allows of the observation being made, we find them actually enclosed in the proliferating cells. On the other hand, the eruption of the dots does not extend beyond the area of possible direct contact with the irritating particles.

What is now the structure of the tubercle in the dead body of man? Let us take the tubercle of the human lung and note down the appearances as they present themselves to the eye.

MILIARY TUBERCLE.—It is evident, in sections of recent miliary tubercle, that the epithelial cells, or as Buhl would call them, endothelial cells,* are enlarged, swollen, granulated, as seen in vertical and other sections of the alveolar wall; also that the floor of the alveolus is covered by such enlarged endothelial cells; and finally, that frequently a mass of such enlarged endothelial cells forms a minute clump lying in the alveolus, either touching on all sides the alveolus wall or retracted at one or other side. Here we have three pictures, giving a history—incomplete it is true—but still an outline of the formation of a tubercle, out of the endothelial cells; and this may be justly viewed in connection with the

* Dr Ludwig Buhl. *Die Lungenentzündung, Tuberculose und Schwindsucht*. Munich. 1872. P. 4. "I hold that it has less of the nature of a prolonged bronchial epithelium than that of a lymphatic endothelium, spreading out over the wall of the alveolus." He compares the case to that of the ovarian tubes, where a mucous epithelium is continuous, with a serous endothelium; and alludes to Sikorsky's note (in the *Centralblatt*, 1870. No. 52) on the communication of lymphatics with the alveoli. Buhl concludes that the alveoli of the lung are "air-filled lymph spaces."

picture formerly given of the formation of the peritoneal tubercle.

This does not mean, however, that the tubercle is never seated in the interstitial tissue of the lung, or that all new formed cells originate from the endothelium, or that the tubercles are limited to single alveoli, and do not extend far and wide. What is meant is, that in a miliary tubercle the alveolus may be often found full of altered cells, while the walls and connective tissue between the alveoli are quite free from infiltration or swelling.

INFILTRATED TUBERCLE.—In the case again of the infiltrated tubercle of Rokitansky, where to the naked eye spongy and opaque solid pigmented areas alternate and intermingle in irregular proportions, the microscope shows in the opaque solid parts:—compressed alveoli in some places; in others, alveoli of the normal size, with the distinct alveolar wall, but the alveolus itself choke-full of cell-forms, so that the part is rendered solid; while in other places the alveoli are not traceable, and the lung parenchyma is changed into a uniformly infiltrated tissue. In the places where the alveoli are seen full of form elements, these show cells of different sizes packed with granular matter, and where the mass is by chance a little withdrawn from the alveolar wall, here and there an adherent swollen endothelial cell. Some alveoli contain large cells, some one large cell (recalling Schuppel's gland cells*), and many smaller cells, some masses of granular matter, in which here and there a nucleus is embedded. In other alveoli the wall is seen coated with regularly arranged cells of different sizes. We have before us, in short, the different stages of endothelial cell-growth, a germinating process in which the cells grow, divide, and, at least in places, change into mere granular matter. The tissue of the walls themselves is infiltrated with small lymphoid corpuscles—on some very thin sections the infiltration between the tissue fibres is clearly visible—so we may say there is here a double process.

* Dr Oskar Schuppel. Untersuchungen über Lymphdrüsen Tuberculose, etc. Tübingen, 1871.

infiltration of the parenchyma and filling up of the alveoli by the same matters as in the alveolar miliary tubercle—the chief difference lying in the infiltration of the parenchyma. Lastly, where the alveoli are compressed or even obliterated, the tissue is consolidated: the alveolar walls infiltrated and swollen, so as to present the appearance of a section of a lymphatic gland, or else mere granular strings; or else (more rarely) the infiltrating cells change into oblong corpuscles, giving to the part a fibrillated appearance.

A section at the edge of a cavern shows an infiltration with nucleated form elements, the nuclei of which are of the average size of the nuclei of white blood corpuscles. The protoplasm round these nuclei varies in amount, being in some instances so thin as to be barely visible, in others rather thicker. The fibres among which the cells lie are disordered; and thicker and thinner fibres are apparent, the former being prolonged into the latter. In places the cells lie in a regular network of fibres. Pigment corpuscles in and out of the cells are seen.

It would seem as if the relation of miliary to infiltrated tubercle might be defined as one of extent. A little wider area involved, a greater degree of interstitial implication, appears to make all the difference; histologically none can be definitely fixed on.* The seat of the first

* Wm. Addison, *op. cit.*, p. 74, "In the first stage of pneumonia the respiratory capillaries are more than usually filled with blood: colourless elements and lymph, or cells and protoplasm loosely adhering to their inner surface. In 24 or 48 hours these colourless elements adhere more closely to and form part of the coats of the vessels—this is the second stage. In two or three days abnormal products appear outside the vessels, filling up the air cells—which constitutes the third stage. In the formation of granulations and tubercles analogous stages occur, the difference being that in pneumonia the nutritive activity arises quickly—usually from some known external irritation—extends simultaneously over a wide expanse of texture: urgent symptoms immediately arise, and on P. M. inspection the changes are at once visible to the naked eye. Whereas, semi-transparent granulations arise more slowly, usually supervening upon some other malady, they evolve no well-marked symptoms, and although often multitudinous and running together, are yet so small as to be limited to almost microscopic spots, requiring a lens and careful investigation for their detection after death. The principal difference, however, as respects ulterior results—the cure—between pneumonia and semi-transparent granulations is in the condition of the natural texture, which, in a hepatised pneumonic lobule, is recoverable, but which, in the crude tubercle resulting from semi-transparent

change is, in the majority of cases, in the endothelium; and, *e.g.*, in the lungs, if the morbid process occur over a patch of alveoli we have, instead of miliary, infiltrated tubercle. The interstitial element I believe to be subordinate to the endothelial, and without wishing to assert that in certain cases interstitial changes may not precede the essentially tubercular one, I should not attribute to the former so much importance. Here, however, it may be well to remember that it is difficult to conceive of any change of an inflammatory nature occurring in any one tissue without implicating the tissues near. Again, the common origin of the connective tissue, blood-vessels and serous sacs from the middle layer of the embryo, brings them very much into one category in their pathological relations, so that a dispute as to the origin of tubercle from the endothelium and not from the connective tissue, loses in theoretical importance. The lung alveoli would at first sight seem to be an exception to the argument, were it not that Buhl's view that the alveolar lining is an endothelium in connection with the lymphatic system again restores the uniformity in the relations of tubercle to development.

The answer to the question as to the presence of a distinguishing element in tubercle must be in the negative. We have seen cells of every kind in tubercle; but we have not a single cell or arrangement of cells of which it can be said that they are in the remotest degree peculiar to tubercle.*

granulations, is irrecoverable." Much of the above may be now modified, but it is important to find an observer of nature, untrammelled by theory, boldly relegating miliary tubercles to the same category as the pneumonic products, under which the infiltrated tubercle of Rokitansky is included. See also Villemin. *Etude sur la Tuberculose*. Paris. 1868. P. 474. "La vérité est que cette pneumonie catarrhale, épithéliale, caséuse, n'importe le nom qu'on lui donne, n'est qu'une variante histologique du tubercule." Consult also Buhl *op. cit.*, p. 107; and Heitzmann in Stricker's *Jahrbucher*, 1874, ii. Heft. p. 22.

* Oscar Schuppel. *Archiv d. Heilkunde*. 1868. Vol. 9. Zur Histogenese der Lebertuberculose, gives the results of his investigation of the origin of tubercle in the liver. He finds that the first traces are to be found in the capillaries. P. 533. "In those places where the tissue of the liver is recognizable, though atrophic, the interior of the vessels is filled partly with blood corpuscles and partly with those large, shining, round, polynuclear cells which we have described as tubercle cells. In places these last are so abundant as to form a compact infarct, and one can speak of a real tubercular

We saw that in the peritoneum a direct mechanical irritation led to localised growth, and no one who has paid unbiassed attention to the subject doubts that the white dots so formed are essentially identical in kind with the miliary tubercles found in man. We saw, further, that in the omentum, away from the vicinity of any blood vessel, irritation, applied to the endothelium, directly induced a change which, except for the leading part taken by the white cell emigration which accompanies the proliferation of the tissue elements in inflammation of vascular parts, is similar to an ordinary inflammatory process. The difference lies in the organisation. The usual course of an inflammatory hyperplasia is that it first becomes vascular and finally cicatricial tissue. A tubercle appears never to do this. The vascular stage is left out, and the cells of the growth either pass into a fibrous condition, or are absorbed, or decay, break up, and lie in the tissues as a foreign body. Much of this may be accounted for by the leading part which the endothelium takes in the formation of tubercle, but much of it cannot be explained at present.*

infiltration which presents not solid nodules but a hepatic cellular network, the interstices of which are filled with tubercle cells." He discusses the origin of the tubercle cells from the endothelium of the blood-vessels, which had been shown by Rindfleisch and himself to proliferate in cancer, and concludes in favour of the white cells of the blood as the source of the tubercle, thus recurring to Addison's view. See the same author. *Ueber die Entstehung der Riesenzellen im Tuberkel*. Archiv d. Heilkunde. 1872. Vol. 13. He here derives these cells from protoplasmic clumps, which appear in the smallest blood vessels. He hints at the unsoundness of the dogma *Omnis cellula e cellula*, and advocates the possibility of an independent origin of cells. See also Klebs. *Beiträge zur Geschichte der Tuberculose*. Archiv d. pathol. Anat. Bd. 44. 1868. P. 287. "The formation of the tubercle begins in the lymphatics, &c., with a proliferation of the endothelium. The newly-formed cells fill first the cavity of the lymphatic vessel, and then dilating the canal, push themselves into the ground substance. Very probably the cells in the lymphatics partake in the proliferating process." Compare also Th. Langhans. *Ueber Riesenzellen mit wandständigen Kernen in Tuberkeln und die fibröse Form des Tuberkels*. Archiv f. path. Anat. Bd. 24. 1868.

* See Rindfleisch. *Lehrbuch der path. Anat.* Leipzig. 3rd ed. 1873. P. 242. Referring to the superficial position of the tubercle, sarcoma, &c., on the peritoneum, he says: "This superficial position comes from the fact that all these tumours, in the first instance at least, are derived from the epithelium of the serous membranes." P. 379. In the lungs he talks about a lymphangitis nodosa which, he says, originates in connective tissue. "If we apply the term tuberculosis we must adopt the following statement: The miliary tubercle arises in the connective tissue; where, however, the connective tissue has a free surface which is covered by endothelium there the

It may not be out of place to repeat the assertion that all the tissues in which tubercles have been found belong originally to the middle layer of the embryo: and we seem justified in adding to this the statement that tubercle is at first a mass of rapidly or slowly growing cells, situated chiefly, though not exclusively, in or on endothelium; later on it may become a mass of debris, the result of abortive cell growth. In no case is the tubercle furnished with blood vessels of its own.

In the experiments given, the tubercles resulted palpably from direct irritation, and those parts of the body remained free from tubercles which were not exposed to the mechanical irritation. But it is not always so. Waldenburg and others found that, after longer intervals, the other regions of the body likewise became affected. Waldenburg endeavours to explain this by saying that tuberculosis is a disease of resorption, that each individual miliary tubercle is the result of a minute embolus, formed by the sticking of tubercular or other matter in a capillary. The cells are, according to him, emigration cells. He founds, in short, upon Addison.* This view cannot apply to the case of the omentum, where the tubercles were formed remote from blood vessels, and it does not chime in with the details of the cell changes in the lung tubercle, or generally with the phenomena there described. Virchow relegates the tubercle to the class of lymphatic tumours, heteroplastic in nature, seated always in the connective tissue or its related groups (marrow, fat, bones).† He has in his mind's eye a type of a tubercle in which lymphoid corpuscles

tubercle arises by preference from proliferation of this endothelium. The miliary tubercle of the omentum gives us the best proof of this. Now, we must include the epithelium of the lymphatics, as well as that of the serous sacs among the endothelium; and, as the cells resemble the tubercle cells, we may regard the lymphangitis nodosa as an ordinary tubercular formation modified by its localisation." Compare Cornil et Ranvier. *Manuel d'Histologie Pathologique*. Paris. 1869. 1st vol. P. 205, et seq., where a description is given of the part taken by the epithelium of the thyroid gland and lungs.

* Wm. Addison. *loc. cit.* p. 41 et seq. and p. 78.

† Virchow. *Die Cellularpathologie*. 4th Ed. 1871. P. 559 et seq. Consult here Schuppel. *Untersuchungen ueber Lymphdrusen Tuberculose*, &c. Tübingen. 1871.

have insinuated themselves among the fibres, so as to look like lymphoid tissue; and this appearance is not hard to find. In ignoring the endothelial changes, however, he lays himself open to an objection which has been raised by Lebert—namely, that if Virchow arbitrarily fixes on the part which looks like lymph gland tissue, and styles it a lymphoma, we are equally entitled to apply a name to the endothelial area and call it epithelioma.* It is plain that this step of Virchow's is one on a path which leads to endless confusion. He makes of course no attempt to explain the causation of the growth, any more than he attempts to explain the cause of the recurrent fibroid. Nor is it necessary, from a histological standpoint, to trace the causation. If it were, a tubercle or tubercular area could be accounted for in two ways—by direct irritation of the tissue by particles, or by a more complicated process which could be put thus: In the body there are innumerable form elements; it is reasonable to suppose that there are infinite variations in the state of vitality of the cells. Any cause acting generally will affect the weaker cells most, and accordingly, a departure from the normal healthy composition of the fluids of the body may give rise to localised cell changes in the weaker classes of cells. In those cases where tubercle gradually involves organ after organ, if the cause do not lie in successive alterations of the cellular activity of the organs, we may seek it in the well-known metastasis of inflammation. To the deterioration generally of the system re-breathed air contributes, but this is all the length we can go with MacCormac,† unless it be added that re-breathed air may directly irritate the lung endothelium, and so give origin to tubercular products.

To the general question of the inflammatory nature of tubercle I have answered in the affirmative‡; but the point un-

* Prof. H. Lebert. *Beitrage zur experim. Pathol. der heerdartigen umschriebenen, disseminirten Lungenentzündung, sowie der Uebertragung der sogenannten Tuberculose anderer entzündlichen und verschiedener neoplastischer Producte vom Menschen auf Thiere* Archiv f. path. Anat. Vol. 40. 1867. P. 561, et seq.

† Henry MacCormac. *Consumption: Its Prevention and Possible Cure*: London: 1865: in which the author ignores the histology of tubercle, and terms it the "soot of the organism." P. 234.

‡ See also Buhl. op. cit. p. 123 et seq.

decided is not less important—namely, Is tubercle specific? Since Villemin* boldly drew tuberculosis into the circle of diseases like scarlet fever or syphilis, which are confessedly communicated from person to person, the current of belief has been directed into deviating channels, the majority of which have led back again to the original non-acceptance of his views. The reasons for this are illustrated in the sixth experiment, where a mixture of cinnabar and water injected into the peritoneal cavity produced a tubercle which could not be distinguished (except for the mixture of colour) from that following the use of tubercular injections.

But the bearings of the discussion do not end here. Is there a virus in the tubercular mother which can infect her child? or is there a virus in the tubercular cow which can impart tubercle to the consumer of the milk? Klebs† (1870) has not hesitated to define the qualities of the supposed virus. It is, according to him, soluble in water, and when taken up by the lymphatics of the intestine may induce tuberculosis. Others fancy that the solid particles may gain access to‡ the circulation, and excite tubercles in distant parts. Gerlach§ fed various animals with the milk of a tubercular cow, and found that 5-6ths of the animals so fed took tubercle; and he concludes that the milk of a tubercular cow is specifically infectious. He has found many byres from which the milk supply of towns was derived, with up to 50 per cent. of the cows in them tubercular. He says truly that these cows are the wet nurses of

* J. A. Villemin. *Études sur la Tuberculose*. Paris: 1868.

† Prof. Klebs in Bern. *Zur Geschichte der Tuberculose*. *Archiv f. path. Anat.* Bd. 49. 1870. p. 291, concludes:—"1. The tubercular virus is soluble in water. 2. The inoculation of the tuberculosis of the cow, by feeding with diseased tissues, which Chauveau has observed, applies also to other animals, and to human tuberculosis (acting by ulcerating the intestine, and gaining access to the system *per* the lymphatics). 3. The tuberculosis of the cow is identical with the 'Perlsucht.' 4. The 'Perlsucht' (fibrous tuberculosis) of the cow owes its origin to the same virus as the human tuberculosis.

‡ Waldenburg: *op. cit.*, p. 406. Also, Cohnheim u. Frankel. *Archiv f. path. Anat.* Bd. 45. 1869. Also, Buhl: *op. cit.* p. 112: et seq.

§ A. C. Gerlach. *Ueber die Impfbarkeit der Tuberculose u. der Perlsucht bei Thieren sowie über die Uebertragbarkeit der letzteren durch Fütterung*. *Archiv f. path. Anat.* Bd. 51. 1870. See also Lœdler. *Das Preussische Physicians Examen*. Berlin. 1872.

the most of the children in large towns—a sufficiently grave fact from his point of view. Slaughter-houses and breeding establishments should, according to him, be purged of such animals. The milk of the goat is safer, as goats are not subject to the “Perlsucht,” or tubercular disease. His remarks are intended to apply to mother’s milk as well as to that from cows.* The subject demands fuller investigation. Can it be that the part played by the “tubercular” milk is limited to mal-nutrition? Or is there a soluble virus? Or are there certain particles in such milk which, when circulating in the blood or lymph, may excite local inflammation? As yet, we cannot definitely say. At all events, the admission of the existence of a “virus,” or the resort to such words as “Dyscrasia,” or “Tendencies,” must be guarded against until very strong proofs indeed are adduced in their favour.

To sum up. In the present state of the enquiry Tubercle is the result of a local inflammation set up in certain cells of deranged vitality by irritation, either from solid particles, or from fluids of a composition unsuited to them. For a reason not yet quite made out, the usual vascularisation of the product is not gone on with, and, therefore, while a tubercle may, and often does, become absorbed, it in most instances fails to receive an adequate supply of nutriment from the blood, and undergoes disorganisation. That there is any “inherent tendency” in the tubercle to disorganise we may safely and decidedly deny.

* Compare Schuppel. Ueber die Identität der Tuberculose mit der “Perlsucht.” Archiv f. path. Anat. Bd. 56. 1872. P. 54.

II.—HÆMATOMA AURIS.

By DR ALEXANDER ROBERTSON, *Physician to the Town's Hospital and Asylum, Glasgow.*

THE condition known as Hæmatoma Auris, or bloody tumour of the ear, is one met with almost solely in asylum practice. It is not, however, absolutely restricted to the insane, for Dr Wilks states in his work on Pathological Anatomy that it is occasionally seen in football players, as the result of violence. But it is so rare outside of asylums, that I would scarcely have written on the subject in a journal intended for the general medical public, had it not been suggested to me that a brief account of it might prove interesting in its pathological connections. This suggestion I am the more disposed to comply with, seeing that I have two patients suffering from it under my care at present, whom I showed at a recent meeting of the Pathological Society of this city; and in the course of my remarks I shall refer more particularly to them.

Its Nature and Course.—Hæmatoma Auris consists of an effusion of blood from the perichondrium, the fibrous membrane that invests the cartilage of the ear. This effusion is dark and venous in its character, and continues long fluid. The swelling is usually first seen on the posterior part of the concha, rather above its centre, and thence extends inwards to the meatus, which it occasionally occludes; and outwards over the pinna sometimes, but not generally, as far as the helix. The tumour so formed varies greatly in size in different cases, there being in some only a slight thickening of the concha, while in others the distention of the auricle is extreme, all the normal irregularities being entirely effaced. When thus severe it occasionally bursts, giving vent to a quantity of blood having the appearance described. It does not usually attain its full size till after several days' growth. The integument over it retains its natural colour in the first instance, but should inflammation set in, as in the more severe cases, particularly those that burst, it becomes red and has

the ordinary aspect of an inflamed surface. In exceptional cases the inflammation is so high that suppuration takes place, and there may even be gangrene of considerable portions of cartilage. In many, probably in most cases, the cartilage involved in the tumour is somewhat softened, but in milder forms this is scarcely appreciable. Generally after two or three weeks it begins to subside slowly, but the pinna is never restored completely to its natural condition, as after many years it continues irregular and shrivelled in aspect.

The forms of Insanity in which it occurs.—It is not confined to any particular form. Thus it is found in mania, melancholia, and in dementia. I do not remember having seen it in idiocy. Probably it is most frequently met with in the insanity associated with general paralysis.

Account of the two cases referred to.—J. M., age 44. This patient has been an inmate of this asylum for the last four years, suffering under general paralysis, with grandiose delusions. About the middle of February a sanguineous tumour began to form in left ear. It was situated chiefly in the concha, but also encroached on the auditory canal at its commencement, blocking it up for a short distance. After about three weeks the swelling began to abate, and now, being more than two months since it appeared, it is little more than half its greatest size, and the skin over it is puckered. The patient's paralytic or mental condition did not show any distinct aggravation when the tumour formed, but during the last six months he has been subject to slight attacks of apoplectic congestion, lasting eight or ten hours, and recurring at intervals of from two to four weeks. The paralysis is advanced, but he can still walk a few yards when assisted.*

* Since the above was written this patient has died. On inspection the brain was found much wasted both in its grey and white substance, and the lining membrane of the ventricles was very granular. Its weight was only 40½ oz. The arachnoid cavity and ventricles together contained about 5 oz. of serosity.

On section, the tumour of the ear was found to be dark and fleshy in aspect, firm and slightly elastic in structure, and adhering closely to the cartilage of the auricle, but less firmly, though with considerable tenacity, to the perichondrium. It was ½ inch in breadth at its thickest part.

I am indebted to my assistant, Dr Barlow, for the following note of the

A. P., age 22. This patient was admitted on 2nd Jan. of this year, on account of acute mania of a few days' standing. It was characterised by great restlessness, constant movement, incessant and utterly incoherent talking. She also laboured under Graves' disease in a distinct but not strongly marked form. The eyeballs projected, there was excitement of the heart's action, and there was considerable expansive swelling of the thyroid gland. On the morning after her admission a remarkable red band made its appearance on the left side of the head and face. Beginning on the brow above the outer part of the superciliary ridge, at the junction of the hair with the forehead, it extended downwards over the outer half of the upper eyelid, over the malar bone, and thence obliquely forward to the chin. On the brow it was about $1\frac{1}{2}$ inches in breadth, but was narrower on the cheek. About midway between the malar bone and the point of the chin it separated into two parts, which continued in the same direction, and reunited after about $\frac{3}{4}$ inch, thus enclosing a small islet of unaffected skin very singular in its appearance. Both ears were red, and particularly the left one, but neither of them was very bright in colour. There was obviously increased redness of the skin below the left ear, not, however, sharply defined like the band above described; and there were two distinctly circumscribed surfaces of a bright red colour, each about the size of a florin, on the back of the neck. It was noted that the red band was slightly raised above the level of the adjoining integument, and was appreciably hotter, but did not seem to be painful; though the last point was necessarily doubtful, owing to the patient's state of mind. On pressure near the chin the redness could be effaced, only to return immediately; but it was more vivid and less impressible on the brow and malar bone. The bright colour gradually faded, and in about three days the parts had regained their normal aspect, except

microscopical appearances: - A transverse section through the pinna and tumour was examined by a power of 350 diameters. The cartilage was in a normal state. The tumour was composed almost entirely of white fibrous tissue, with here and there collections of shrivelled blood corpuscles, the fibres being stained at these points with blood pigment. The fibrous tissue was denser at the point of junction of the cartilage with the tumour than at any other part.

that the site of the band on the face was marked by the shedding of fine furfuraceous scales for two days longer.

Its Causation.—A very simple explanation has been given of this remarkable condition by some writers, such as Dr Wilks, but one which, if correct, would have left me no apology for occupying the time of the reader with this paper. It is that the hæmatoma is the result of violence either self-inflicted or by others. I am satisfied, however, that in most cases this is not the real cause. Certainly some instances have been reported by physicians to asylums in which it seemed to have been caused by an injury to the ear. But in some of these there may not improbably have been a constitutional disposition to this sanguineous effusion at the time of its appearance, so that the slight blow or fall to which it was ascribed was only a secondary and minor agent in its production. At all events, my own experience would lead me to this conclusion. In the course of a long connection with asylums, many cases of it have come under my observation. In not one of them have I been able, either by a careful examination of the patient or by inquiry at attendants or fellow-patients, to find indications of injury to the ear, though obviously where it occurred in acute mania it could not be shown absolutely that no hurt had been sustained by the patients, particularly at night when alone in their bedrooms.

How then are we to account for it?—It is, I think, most probably due to functional disorder of the cervical sympathetic, associated with and perhaps resulting from the existing cerebral or cerebro-spinal disturbance. The grounds for this opinion are these: (1.) It not unfrequently appears in both ears simultaneously, without any indication of either having been injured. (2.) In a case of dementia in my own practice, some years since, I observed an effusion of blood under the conjunctiva of the eye on the same side as the tumour of the ear, both effusions having appeared at the same time; and neither ear nor eye showed the least mark of hurt having been sustained. In this case there was no general purpuric affection; nor in any case, so far as I

have seen, can the disease be ascribed to that condition of the blood. And (3.) a hæmatema of each ear occurred in the second case recorded in this paper, in which the Graves' disease and the peculiar band described indicated very clearly that the vaso-motor system was disordered. No doubt there was an interval of several weeks between the latter symptom and the ear affection, but the goitre still existed though the exophthalmos was in abeyance at the time. It may be urged, supposing the sympathetic in the neck to be affected, how does it happen that the other symptoms produced by a known lesion of that system are not generally present, such as redness of the side of the head, contraction of the pupil, &c.? To this it may be answered that in functional disturbance of the nervous system, whether sympathetic or cerebro-spinal, it is by no means unusual to find a single nerve, or even a single branch of a nerve, alone affected. And further, various considerations lead me to think that in most cases in which the ear-tumour is found there is hyperamia—implying vaso-motor disorder in the pia mater cerebri and hemispherical ganglia—parts whose blood vessels, like those of the auricle, derive their regulating nerves from the cervical sympathetic.

Its bearing on the Prognosis of the Associated Insanity.—This must be considered as decidedly unfavourable. It is rarely met with unless where the mind is profoundly affected. I have not yet seen a case of recovery where the symptom was present. Still, such recoveries in other asylums have been recorded, so that its appearance does not stamp the insanity as absolutely hopeless.

III.—ON THE PREVENTION OF PUTREFACTION AND THE DESTRUCTION OF CONTAGIA.

By JOHN DOUGALL, M.D.

(Read before the Medico-Chirurgical Society of Glasgow, April 2, 1875.)

THE truths involved in the consideration of the prevention of putrefaction and the destruction of contagia, seem to me enveloped in a dense nebula of unwarranted assumptions and conflicting hypotheses. I think it imperative, therefore, instead of unheedingly passing through this thick haze, and at once laying hold of facts, to go through it leisurely, examining its constituents, and measuring its extent, until we reach some rays of the small clear light sparkling in its centre.

With this object I have arranged the two divisions of my paper into three parts.—1st, the nature; 2nd, the alleged causes; 3rd, the prevention, of putrefaction. 1st, the nature; 2nd, the origin; 3rd, the destruction, of contagia.

1st. THE NATURE OF PUTREFACTION.—Putrefaction is a process of reduction. A familiar law in the chemistry of organic bodies is that the greater the number of equivalents of elements forming the atoms of a compound, the less is the stability of that compound. This instability is augmented in animal bodies by their containing nitrogen, which of all the elements has least tenacity in its affinities. Also by the large quantity of water naturally present (about 75 per cent. in muscle), which furnishes a most favourable medium for putrefaction. The chemical forces exercised by the living tissues on vital organic compounds ceasing at death, the several elements of the original compound combine to form bodies less complex, but more stable. It is this combination which constitutes putrefaction—as follows:—

Chemical Aspects of Putrefaction.—The chief elements in animal matter are oxygen, hydrogen, carbon, nitrogen, phosphorus, and sulphur. The hydrogen unites with the oxygen to form water, with the nitrogen to form ammonia, with the sulphur, phosphorus, and carbon, to form sulphuretted, phosphuretted, and carburetted hydrogen gases. The oxygen also unites with the carbon to form carbonic anhydride. In course of time the ammonia is oxidised into nitrous and nitric acids and water; the sulphuretted hydrogen into sulphurous and sul-

phuric acids and water; the phosphuretted hydrogen into phosphoric acid and water; and the carburetted hydrogen into carbonic anhydride and water.

Physical Aspects of Putrefaction.—A delicate film usually at first appears on the surface of the (animal) fluid, which, seen by the microscope, consists of millions of motionless opaque specks, size from 1-40,000 of an inch and less. These are embryonal bacteria in a vertical position. A few hours later, countless myriads of free swimming organisms are seen, accompanied by fetor and turbidity. In from 9 to 12 months the sp. gr. of the fluid—at first perhaps about 1·6—is at zero, or at most 1·1. Life, odour, and haze, are all but extinct, and the fluid gives no response to the tests for albumen—in short, putrefaction is expended.

2nd. THE ALLEGED CAUSES OF PUTREFACTION.—In regard to these, there are two schools of opinion. One holds that bacteria and their allies are the likelier cause, of which, perhaps the ablest exponent in this country is Sanderson. In a lecture published in the *British Medical Journal* on the 16th January last, at page 71, he states, what is now well known, and what I think was first enunciated by Pasteur, “that bacteria, like plants, do not require albuminous compounds for building up their protoplasm; that ammonia is sufficient to supply them with nitrogen, and therefore,” he says, “it is more than probable that in septic processes they derive their nitrogen and carbon, not from the albuminous compounds themselves, but from their ultimate products. This being the case,” he continues, “we must regard bacterial life, so far as it consists of the building up of new protoplasm, as a process consequent on putrefaction, for disintegration must have proceeded to the production of ammonia, before new integration could take place.” But while admitting this, he adds, “It is not rendered more or less probable that bacteria are the efficient cause of putrefaction; there is not the shadow of an objection to the assumption that on the one hand bacteria derive material for the integration of their protoplasm from the products of disintegration of the soil in which they flourish, and on the other that they produce the ferment by which disintegration is deter-

mined." Now, in the following lecture, Dr Sanderson plainly speaks as if the latter proposition were not an assumption, but a truth; whereas the first proposition is a proven fact, and the second merely an assumption. Hence, it may be definitely asserted that putrefaction precedes the appearance of organisms, while his view that these, while invisible, may also cause putrefaction, is merely a supposition.

Another argument in favour of the bacterial origin of putrefaction is, that it is always accompanied by organisms; another, that if these be destroyed by chemical or other agents, putrefaction is arrested; and another, that if a solution of animal matter, or of certain salts, be boiled in a flask, and the flask sealed, or its neck stuffed with cotton wool during ebullition, or previously bent, with its orifice looking downwards, or formed into contortions, with its orifice looking upwards, the solution does not putrefy. But should the flask be left unsealed, unstuffed, or should its neck be unbent, or the contorted portion broken off, or, according to Sanderson, should a drop of distilled water, a thread of silk, or a hair, be brought in contact with the fluid, or if it is prepared with ammoniac tartrate, &c., and the flask immediately re-sealed, re-stuffed, or otherwise made as it was, decomposition of the contents soon takes place, because the germs of bacteria have thereby access, or are introduced into the fluid.

The other or physico-chemical school holds that bacteria are mere innocent concomitants of putrefaction and its result—that their *rôle* is the integration of organic particles into their own protoplasm as these are breaking down into inorganic; hence they are constructive, not destructive. This seems to me obvious from the fact that a bacterium must be more highly organised than a speck of decaying albumen, or a mixture of potassic and calcic phosphate with magnesian sulphate, and ammoniac tartrate.* The disciples of this school concede, in the majority of cases, that the arrestment of putrefaction is coincident with the destruction of bacteria, etc., by chemicals, etc.; but they argue, and I think rightly, that the organisms are not solely acted on, that the

* Bacteria flourish exuberantly in a solution of these salts.

soil or pabulum on which they are thriving is affected as well, hence its decomposition may be arrested by some *modus operandi* not easily explained; so that the bacteria die, not only from the foreign body acting on them as a poison, but also from starvation. What arrests putrefaction in decaying matter (of course) prevents it in fresh matter, and *vice versa*. Hence the action of the arrestant is that of the preventive, and if that of the preventive, it follows that putrescent and putrescible soils are antisepted independently of any alleged toxic action on concomitant or aërial contiguous organisms.

The adherents of the physico-chemical school explain the absence of putrefaction in the boiled solutions in flasks, by saying that it is not prevented by destruction of contained bacteria or their supposed germs by boiling, and their subsequent exclusion by the stuffed, bent, or contorted neck of the flask (though they may, or may not admit the possibility of their being in the circumstances both destroyed and excluded); but by the destruction and intercepting of minute portions of putrid matter which, as Liebig has shown, communicates its peculiar condition, by contact, to substances susceptible of the same changes.

It might be here asked, is it not possible, by some contrivance, to prevent the appearance of bacteria in a solution of unboiled animal matter, and at the same time allow free access of air? as the result would show whether putrefaction would proceed without organisms. Yes, it is possible. If to a solution of blood serum of sp. gr. about 1.6, about 1-8th to 1-10th its bulk of liq. potassæ be added, and the mixture freely exposed without previous boiling, putrefaction proceeds at an accelerated pace till expended, the latter being inferred from the mixture ceasing to respond to the tests for albumen. There is a complete absence of bacteria, hence of turbidity, and in a few days no bad odour. It is a well-known law that alkalies hasten the decomposition of organic matter. Now, in this experiment, as putrefaction proceeds, the fluid is too caustic to allow bacterial life, while the absence of bad odour is the result of the consentaneous

oxidation of the fetid products with their evolution. But it may be argued that this experiment only proves that organisms are not the only cause of putrefaction (a concession which, as it seems to me, at once divests the germ theory of its exclusive nature), that if the reverse could be shown, viz., an animal fluid containing organisms and yet not putrefying, that would be "proof positive." Now, while I cannot see my way to believe that bacteria and their allies are the cause of putrefaction, I am fully convinced they are its surest sign—that we may have putrefaction without bacteria, but never bacteria in a solution of animal matter without putrefaction. But although bacteria, etc., cannot exist in an animal fluid without putrefaction, they can be rapidly and exuberantly grown in a solution of the salts already noticed, which are incapable of putrescent decay, and this, I think, renders the proof as convincing as needs be against the bacterial origin of putrefaction, because, on the one hand, putrefaction may exist without bacteria, and on the other bacteria without putrefaction. Moreover, Dr Bastian, whose elaborate investigations do honour to British experimental biology, has shown in an able paper read before the Royal Society,* "on the temperature at which bacteria, vibriones, and their supposed germs are killed," and on the causes of putrefaction and fermentation, "that certain more changeable fluids, *i.e.*, fluids rich in nitrogen, after boiling and when exposed to filtered air, or cut off from contact with air, do nevertheless putrefy, and therefore need neither living units nor dead organic particles to initiate those changes which lead to the evolution of living organisms." Briefly, Dr Bastian has proven that putrefaction may arise *de novo*, and judging from the composition of certain organic bodies, there seems no *à priori* reason why it should not.

3rd. THE PREVENTION OF PUTREFACTION.—This is done chiefly by cold, exclusion of air, dessication, the application or admixture of certain foreign bodies chiefly chemical. I shall confine my remarks to the latter.

* Proc. Royal Society, No. 145, 1873.

There is one point of great prominence which constitutes a fundamental law in regard to the prevention of putrefaction—viz., that bacteria and vibriones require for their proper development a neutral or alkaline medium, and fungi an acid one. *Ergo* to prevent or arrest putrefaction, acidify considerably the bacteric environment, and fermentation is produced, known by the absence of putrid odour, turbidity, and motile organisms, and the presence of torulæ and mycelial tufts, also by rapidity of decomposition. By adding more acid the fluid neither putrefies nor ferments. The converse also partly obtains—by the moderate addition of potash to a fermenting solution, fermescence is arrested and putrescence induced, but if added in excess the latter is greatly accelerated, as already stated, *minus* its usual physical phenomena. The action of acids and alkalies on a solution of animal matter may be summed up thus—acids added in small proportion to a fresh solution cause it to ferment and prevent it putrefying. Added in large proportion they prevent both putrefaction and fermentation. Added in small proportion to a putrid solution, putrescence is arrested and fermescence induced. Added in large proportion to a fermenting or putrid solution, both processes cease indefinitely.

Alkalies added in small proportion to a fresh solution hasten its putrefaction and prevent fermentation. Added in large proportion they prevent fermentation and quicken putrefaction, *minus* its usual sensible properties. Added in small proportion to a fermenting solution fermescence is arrested, and putrescence induced. Potash added in small proportion to a putrid solution exacerbates putrescence. Added in excess, putrefaction is soon expended.

From the foregoing remarks it will be seen that, where circumstances admit, we have it in our power to induce fermentation at will, should that be deemed preferable to putrefaction, or to prevent both. But it may be urged, may not a fermenting fluid be as objectionable as a putrefying one? I think not. Putrescent matter evolving nauseating effluvia for nearly twelve months must be more hurtful than

fermenting matter almost odourless, and being fully decomposed in about three months, while the torulæ found in this fermentation are identical with those swallowed alive by the million by beer drinkers, and the other fungi with those present in butter-milk, cheese, fruits, &c., which are also swallowed with impunity.*

I now come to the second division of the subject, and proceed to consider—

1st. THE NATURE OF CONTAGIA.—So little is known of the essential toxic principle of contagia that this part must be treated briefly. As with putrefaction, we have here also two shades of opinion; one is that contagia are of the nature of fungi, or allied to bacteria, perhaps bacteria themselves. Sanderson is of opinion that the latter may constitute communicable poison, or are probably the carriers of it. The other opinion is that contagia consist of minute particles of albumenoid matter in an unknown state of synthesis. Thus the same origin is assigned to zymotic disease as to putrefaction; while to complete the analogy, as Dr Bastian showed that putrefaction may arise *de novo*. Dr Richardson and others hold that contagia may be spontaneously evolved. These two opinions, however, are still *sub judice*, but it seems to me the physico-chemical theory is nearer the truth than the vital theory, being more in accordance with the few well-ascertained facts. These refer chiefly to the morphology, &c., of vaccinine and varioline, nothing definite being known of the physical aspects of the other zymotica. Dr Klein, of the Brown Institution, London, is at present investigating the minute pathology of enteric fever, and possibly, when his labours are completed, some new facts may be disclosed. As to vaccinine and varioline, these are colourless, lymph albumens, alkaline in reaction, coagul-

* At this point of the paper, thirty-six tubes were shown, containing uniform portions of a solution of blood serum, and of a chemical substance. The mixtures had been in the tubes for fourteen months, and presented a varied appearance to the naked eye. The tube with benzoic acid was conspicuous from its being the only one free from haze and sediment. Its contents were as fresh and clear as on the day the tube was filled. This substance is certainly a powerful antiseptic. See "Putrefiers and Antiseptics," *Glasgow Medical Journal*, Nov. 1872 and Feb. 1873.

able by heat, precipitated by certain acid bodies, and odourless. Dr Braidwood, of Birkenhead, in an interesting paper—"The Morphology of Vaccine Lymph," concludes "that the latter presents three very distinct species in human variola, variola vaccinae, and in variola equinia. That the virus of variola ovina may be allied to those, but this has not yet been determined. That an attack of one of these by inoculation or contagion protects against the other two members of the species. That this protective quality distinguishes this type of virus from that of other epidemic fevers. That vaccine virus is unaffected by, and does not affect other febrile viruses. That the syphilitic virus more closely resembles the vaccine than do other febrile viruses, being inoculable, and almost always affording protection against a second attack; but it differs from variolic viruses in not being contagious (infectious) under any circumstances, and being incapable of inoculation into the lower animals. That the several febrile viruses differ from one another, and operate on separate elements of the blood."

Dr B. W. Richardson, ten years ago, produced pyæmic poison salts from the serous fluids of a pyæmic patient, by the addition of hydrochloric and sulphuric acids. These he termed hydrochlorate and sulphate of septine. From this it was inferred that the base was of an alkaloidal character. In the present year he found that all septinous poisons liberate oxygen from peroxide of hydrogen with evolution of heat, from which he concludes that the septinous product acts upon the blood in the extreme circulation, when it has accumulated in sufficient quantity, by liberating a portion of oxygen, and hence creating a febrile temperature.

A portion of variolic or vaccine lymph placed under the microscope is seen to consist of a mixture of *granules* about 1-20,000 of an inch in diameter, and certain corpuscles not unlike those of pus, termed *leucocytes*, suspended in the lymph plasma. Chauveau found that the leucocytes and plasma *per se*, or separately, had no power of infection, while the smallest portion of the granules which could be used caused their characteristic disease. He, however, discovered latterly that

the leucocytes were the receptacles of the granules, the latter growing in the former like seeds in a capsule, as granules set free by rupturing leucocytes were found to infect.

2nd. THE ORIGIN OF CONTAGIA.—This is a subject I shall merely touch, but which is deserving of far greater attention than it has hitherto received, and which must be thoroughly investigated if epidemic disease is to be checked or extinguished. While admitting in the fullest sense the communicable nature of zymotic poisons, I am of opinion they have all arisen, may all arise, and some at present do arise, *de novo*. It seems to me futile to argue against the spontaneous origin of any single zymotic malady, smallpox for instance, by saying it may always be traced to a previous case, for this reason, that the conditions under which it was generated may have ceased to exist, while those under which it disseminates still prevail. A contagium evolving spontaneously, say amidst festering accumulations of nitrogenous *debris* (the undoubted primary source of all contagia), may subsequently require, and in most cases does require, nothing more for its propagation than some peculiar condition of the body, indicating a little, if any, lowering of the health standard, and thus it may perpetuate itself after its natal conditions are extinct. In other words, some infectious viruses seem to exist in media less inimical to health than are required for their generation *de novo*. Hence zymotic explosions indicate mal-hygienic conditions unusually favourable for the multiplication of existing contagia; and should these conditions obtain to a higher degree in quality, time, and space, not only may existing virus be largely and rapidly reproduced, but fresh quantities spontaneously evolved. Furthermore, there are facts showing that storms of contagia, such as those of Plague, Relapsing Fever, &c., may arise *de novo* under certain abnormal conditions of the body and surrounding media, scatter the poison profusely around with sudden alacrity, and when these conditions are removed, cease, being unable to exist unless in a comparatively exceptional nidus. Well might Dr Richardson ask where are the germs of the Plague, Sweating Sickness, and Black death? Has improved sanitation anything to do with their absence? To which I might add,

would a return to the conditions then existing, with a London death-rate of about 50 per thousand, not again conjure to life the deadly viruses of these fearful pestilences? And moreover, would further improved sanitation not diminish the mortality of all, nay, even check the evolution of some existing zymotic distempers, so as also to render them matters of history?

The last division for consideration here is—

3rd. **THE DESTRUCTION OF CONTAGIA.**—This point is necessarily of a very abstract character. For although contagia make their presence felt widely and conclusively, and though their specificity seems varied and definite, yet, as already stated, almost none have been isolated. I am compelled, therefore, to confine my remarks on this point to the destruction of the infecting power of vaccine lymph, the only virus with which it is safe to experiment on the human subject. The results of these experiments can, therefore, only be applied inferentially to the other hypothetical febrile viruses. I shall first notice what does, and secondly what does not, destroy the infecting power of vaccine lymph.

Dr Henry, of Manchester, showed, in 1831, that dry vaccine lymph, heated for 2 hours to 140° Fah., failed to produce vaccinia.

I myself made the following experiments:—Separate portions of vaccine lymph were exposed for 24 hours, under identical conditions to various volatile media. They were then liquified by neutral glycerine, the reaction of the mixture ascertained, and sealed in tubes till children were vaccinated with them. The results showed that with the mixtures of lymph and glycerine which were neutral or alkaline, vaccination was successful, while with those that were acid it was unsuccessful.* These experiments were repeated with the acid bodies only, but the acidized lymph instead of being sealed in tubes was exposed to the air for about 12 days in order to see whether the infecting power of the lymph was merely suspended. The results, however, were the same as when the lymph was at once sealed in tubes. The volatile bodies which destroyed the infecting power of the lymph were sulphurous, nitrous, glacial acetic, and hydrochloric acids, and the vapour of chloride of lime.

* Glasgow Medical Journal, loc. cit.

Two tubes of vaccine lymph were mixed with m_{ss} liq. pot. B.P. Twenty-four hours after, the mixture, now dried into a film, was moistened with water, and a child vaccinated with it. The operation was *unsuccessful*. Two tubes of lymph were mixed with m_i of a mixture consisting of 1 part of liq. pot. in 20 of water. One day after the residual film was moistened with water, and a child *successfully* vaccinated with it.

This experiment was repeated, but the mixture, instead of being used to vaccinate one day after its preparation, was laid aside for 10 days, in order to see whether more prolonged contact of potash and lymph would annul the latter's infecting powers in accordance with the law that alkalies hasten the oxidation of organic matter. The remaining film was moistened with water, and a child vaccinated with it. The operation was *unsuccessful*.

I shall now consider what does not destroy the infecting power of vaccine lymph. Melsens in the *Journal de Pharmacie et de Chemie*, 1870, shows that vaccine lymph retains its activity when exposed to the intense cold of -80° centigrade.

In my own experiments alluded to, I found that the concentrated vapours of carbolic acid, chloroform, camphor, ether, and iodine, had no impression on lymph. This result was more expressive with carbolic acid, as through an inadvertency it was allowed to act on its lymph 12 hours longer than were the other bodies on theirs. As this was confirmatory of previous effects obtained from carbolic acid, I resolved to investigate the matter further, more especially as Lemaire states he found that vaccine mixed with carbolic acid failed to vaccinate. Also, that in infants, when immediately after vaccination the puncture was touched with carbolic acid, no vaccinal vesicle resulted. Crookes also says that a trace of carbolic acid annuls the infecting power of vaccine lymph. Besides, as you are aware, this body has been extolled as the *ne plus ultra* of antizymotics.

I accordingly made the following amongst other experiments:—

(1) A tube of vaccine lymph was mixed with m_i of a 1 in 50 aqueous solution of carbolic acid, exposed to common air

for 10 days. The resulting film was then moistened with water, reaction neutral, and a child successfully vaccinated with it.

(2) A tube of vaccine lymph was mixed with m_{ii} of a 1 in 20 aqueous solution of carbolic acid, equal to 1-5th grain of pure acid. The mixture was bulky from coagulation of the lymph, and was at once sealed in tubes. Five days after a child was vaccinated with it. The operation was unsuccessful.

(3) The second experiment was repeated, but the mixture of lymph and acid, instead of being immediately sealed in tubes, was exposed on a slip of glass for 14 days, and a child successfully vaccinated with it.

(4) The third experiment was repeated, excepting that the carbolized lymph was exposed only 12 days. Vaccination was again successful.

These experiments with carbolic acid and vaccine lymph prove—That the infecting property of the lymph is unaffected after being buried for 36 hours in an atmosphere of concentrated carbolic vapour. That even when vaccinine is incorporated with what is manifestly a large quantity of carbolic acid (nearly equal parts), its infecting property may be but suspended, and that only when the mixture is hermetically sealed from the atmosphere. That if such a mixture be exposed to common air for 12 days, its lymph is normally active. The negative results obtained by Lemaire and Crookes, and in my second experiment, are explained by the mixture having been used to vaccinate soon after its preparation, when probably the coagulation of the lymph prevented its absorption by the dermal capillaries. Whereas, when the acid is allowed to volatilise for 12 days, the lymph is rendered more soluble in water, and being still unimpaired by its recent union with the carbolic acid, vaccinates successfully as stated. Now, when vaccinine is thus so obviously unaltered by carbolic acid, and remembering that vaccinine is inimical to varioline, it seems a just conclusion, if we are to be allowed to reason at all, that, at least, to a similar degree, will varioline be unaltered by

carbolic acid; and if so, I submit there is a strong presumption that all zymotic poisons will, under the same circumstances, remain active, and not only so, but that carbolic acid rather antisepts, rather preserves, than destroys their zymotic powers; moreover, it will be conceded that the conditions of the experiments were highly in favour of carbolic acid, the proportion of that substance present being greatly in excess of the quantity which it is possible to use in practical excremental or aërial disinfection. Briefly, the experiments show that the use of pure antiseptics as anti-zymotics is a palpable paradox, preservation being practised, and destruction expected.

Furthermore, as vaccinine is made inert by the acid vapours adverted to, it seems a logical inference that so will varioline, because, as vaccinia prevents variola, so that which annuls the virile power of vaccinine, must of necessity annul the virile power of varioline. Therefore I hold it would be justifiable in practice to extend these inferences, so as to include all infecta and contagia.

The last experiment with vaccinine and potash shows that the infecting property of lymph may be quickly destroyed by mixture with an excess of potash.

The second proves that a moderate quantity of potash mixed with lymph does not soon annul its infecting powers.

The third shows that if the conditions of the second are prolonged for 10 days, the lymph is made non-infective. From these results it may be justly concluded that variolous and other zymotic poisons would, in the same circumstances, be affected similarly to the lymph, also that the other alkalies would act on lymph similarly to the potash, and in like manner on the other zymotica.

IV.—CLINICAL SURGICAL REPORT FOR THE YEAR 1874.

By GEORGE BUCHANAN, M.A., M.D., *Professor of Clinical Surgery in the University of Glasgow, &c.* *

THE surgical practice referred to in the following statistical paper extends from 1st January till 1st November, 1874, at which date I retired from the office of Surgeon to the Royal Infirmary, and entered on duty as Surgeon to the new Western Infirmary. I have been full surgeon continuously since 1860, with the exception of one year, 1869, when, by the regulations existing at that time, I was ineligible for re-election for one year. From this lengthened experience I am in a position to state that there are few, if any, medical schools in this country where the opportunities for acquiring practical knowledge are equal to those afforded to our Glasgow students.

THE NUMBER OF CASES ADMITTED DURING THE PERIOD REFERRED TO WAS AS FOLLOWS:—

	Total.	Cured or Relieved.	Died.
Casualty Ward	95	84	11
Female "	101	100	1
Chronic (Male)	99	95	4
Burns	8	7	1
Erysipelas	3	3	0
	<hr/> 306	<hr/> 289	<hr/> 17

TABLE OF PRINCIPAL ACCIDENTS ADMITTED FROM JANUARY 1st
TO OCTOBER 25th, 1874.

SIMPLE FRACTURES—	Radius,	1
Thigh,	19	
Tibia and Fibula,	11	
Tibia,	7	
Fibula,	6	
Humerus,	5	
Radius and Ulna,	4	
Radius,	3	
Ulna,	1	
Clavicle,	12	
Scapula,	2	
Ribs,	6	
Pelvis,	2	
Base of Skull,	4	
Lower Jaw,	2	
COMPOUND FRACTURES—		
Tibia and Fibula,	5	
Humerus,	1	
Oss. Caudex,	2	
Fingers and Toes,	6	
Skull,	4	
	Radius,	1
	DISLOCATIONS—	
	Hip Joint,	1
	Shoulder Joint,	9
	Elbow,	1
	Thumb,	2
	Finger,	2
	Lower Jaw,	1
	SCALP WOUNDS,	13
	CUT-THROATS,	1
	SPRAINS—	
	Ankle,	2
	Wrist,	8
	SMASHES—	
	Foot,	5
	Leg,	2
	Thigh,	2
	Hand,	2
	Forearm,	1
	Fingers,	12

* The statistics were compiled from the hospital records by Mr Barlow, House Surgeon.

The cases which proved fatal, exclusive of the five which died after operation, were the following:—

W. S., aged 36 years. Admitted on February 9th, 1874, suffering from severe shock, caused by a fall from a roof. Fracture of ribs, emphysema over whole trunk; severe dyspnœa; rusty sputum. Died same day.

H. R., aged 11 years. Admitted on 30th January, 1874, suffering from severe dyspnœa, with emphysema over whole trunk; hæmoptysis and shock; ribs fractured on left side. Died two hours after admission.

D. F., aged 32 years. Admitted February 28th, 1874, in an insensible state, with an incised wound on back part of head. Recovered consciousness, but became again insensible on March 13th, with stertorous breathing and dilated pupils. Died on March 14th. Post-mortem examination revealed a fracture of base of skull, with rupture of lateral sinuses.

W. S., aged 18 years. Admitted on March 11th, 1874, with swelling of head and face, and discolouration, caused by the falling of a log of wood. Died comatose, March 19th. Post-mortem examination showed fracture of base of skull, and inflammation of meninges of brain.

M. W., aged 24 years. Admitted March 31st, 1874, with the whole scalp torn off by machinery, and completely separated. It was replaced and held in position by stitches. April 4th—No union having occurred, the scalp was removed. Five days later tetanus appeared, and caused the patient's death on April 11th.

J. W., aged 48 years. Admitted on May 28th, 1874, with two sinuses in the perineum, and with symptoms of renal affection. Patient died on June 13th, and the post-mortem examination revealed extensive pyo-nephrosis.

E. W., aged 35 years. Admitted on June 11th, 1874, with necrosis of ramus of pubes, and ischium and extensive sinuses in the perineum. Had been ill for past 18 months. On June 25th a large quantity of pus evacuated from outer side of thigh, by an opening made through fascia lata. Patient had rigors, and difficulty of breathing. He died on

the 30th, and the post-mortem examination showed numerous abscesses in lungs and liver, evidently of pyæmic origin.

T. C., aged 70 years. Admitted on October 7th, with retention of urine, arising from enlarged prostate. This was relieved by the passage of a catheter daily, until the man's death, from chronic bronchitis, on the 18th October.

J. D., aged 22 years. Admitted with burn of second and third degree, affecting whole body. Died from exhaustion on the third day after admission.

C. J., aged 22 years. Admitted on May 30th, 1874, with a compound fracture of right os calcis, the wound extending from the seat of fracture along the outer side of foot for a distance of four inches. This injury was caused by a railway waggon passing over the foot. Patient was seven hours lying on the ground before he obtained any assistance, and a period of 24 hours elapsed from time of reception of injury to his admittance into hospital. An attempt was made to render the wound antiseptic, but the discharge became putrid. An attack of erysipelas, affecting that foot and leg, occurred, and the patient died on July 3rd, after having one rigor, probably from pyæmia. No post-mortem examination allowed.

C. J. F., aged 3 years. Admitted July 29th, 1874, with the following injuries, the result of a blast explosion:—A compound fracture of left tibia, about its middle; chest and arms burnt; a compound comminuted fracture of orbital plate of right frontal bone, and laceration of skin covering forehead and eyelids. Brain substance detected in the matter collected about the orbit. Patient became restless on August 1st. On August 3rd passed his urine involuntarily, and died comatose on August 4th, 1874.

R. C., aged 27 years. Admitted on August 8th, 1874, with a compound fracture of os calcis, a portion of which was removed. The hæmorrhage was copious, but was controlled by a compress of compressed sponge. Patient was a collier, and was of intemperate habits. Four days after admission he had a rigor, the wound became unhealthy, and did not secrete pus: on the eighth day fluctuation was

apparent in both knee-joints, and the lymphatic vessels of leg were inflamed. He died on August 24th, of pyæmia. The post-mortem examination showed that there were no abscesses in lungs or liver, but the joints in both legs and arms were filled with characteristic pus.

The cases in which death followed an operation were five in number.

J. F. T., aged 24 years. Admitted from erysipelas ward on 7th February, 1874, with gangrene of both feet, the result of erysipelas. Both feet were amputated by equal flaps at junction of lower fourth of leg with upper three-fourths. February 11th—Erysipelas again attacked the patient, and he died on February 26th, after rigors, vomiting, and sweating. He was insensible for eight hours before death.

J. J., aged 16 years. Admitted on April 10th with a smash of right foot, a fracture of lower jaw, and a severe scalp wound, the result of a railway accident. The patient's condition prevented immediate removal of the limb, but it was removed at the ankle-joint next day. Head shaved; small quantities of brandy and beef-tea to be given to patient. April 14th—Patient sensible, and answers questions. April 20th—Patient restless and delirious; complains of great thirst; passes urine and fæces involuntarily. April 23rd—Patient very violent, requiring restraint. April 24th—Died. Post-mortem examination revealed a transverse fracture through petrous portion of temporal bone, without displacement or effusion of blood. Yellow masses, suggestive of inflammatory exudation, present. Small laceration of brain on the under surface of temporo-sphenoidal lobe.

D. M'E., aged 45 years. Admitted on August 8th, 1874, with smash of both feet, caused by a railway engine passing over both of them. Both limbs amputated at junction of middle and lower third of legs. Flaps bruised considerably. August 12th—Limbs emphysematous; patient slightly delirious; on anterior surface of left leg a black slough forming. August 15th—Patient delirious, and tossing the limbs about; refused to take nourishment; morphia injected subcutaneously. August 16th—Morphia injection repeated; a great amount

of pus is being discharged from both stumps. August 19th—Patient died to-day. No post-mortem allowed.

J. M.B., aged 8 years. Admitted on September 17th, 1874, with a smash of left leg and thigh, and simple fracture of right femur, produced by being run over by a waggon. The thigh was amputated at the junction of upper fourth with lower three-fourths. The flaps, especially the outer one, considerably bruised. September 18th—Feverish. September 19th—Condition of patient better, but is very weak. September 20—Died at 6-20 a.m.

W. A., aged 48 years. Admitted on October 2nd, with acute strangulated inguinal hernia of 16 hours' duration. Herniotomy performed by Dr Paterson. Operation performed under the spray, and wound dressed antiseptically. Two days after he complained of abdominal uneasiness. 1 grain of opium was given every three hours, but he died on the evening of the 4th, with symptoms of peritonitis.

From the accompanying tables it will be seen that 99 operations of greater or less magnitude, were performed during the period referred to, with five deaths or 1 in 20, or 5 per cent. The particulars of the cases are sufficiently indicated in the tables.

TABLE OF OPERATIONS BY DR G. BUCHANAN, 1874.

Nine Amputations of Thigh.

Jan. 15	M. L.	Strumous arthritis	Carden	Well
Feb. 14	W. T.	Smash of leg	"	"
Mar. 6	H. H. aged 14	Hæmorrhage from popliteal artery sloughing	"	"
" 27	G. G.	" 16 Disease of knee joint	"	"
April 6	J. S.	" 20 Strumous arthritis	"	"
July 10	J. C.	" 20 Deformity and atrophy, result of strumous arthritis	"	"
Sept. 17	J. M. B.	" 6 Smash of thigh	Amput. through upper third	Death from shock.
Oct. 15	A. B.	Disease of ankle and old necrosis of tibia	Carden	Well
" 24	J. M. P.	Necrosis of head of tibia and of end of femur	" (Seedy. Hæm.)	"

Seven Amputations of Leg.

Jan. 21	T. W. aged 12	Caries of ankle	Amputation at lower third	Well
" 30	J. F.	" 24 Gangrene of both feet	Amputation	Death Pyæmia.
Mar. 4	J. M. G.	" 18 Caries of tibia	"	Well
" 6	W. S.	" 45 Caries of tarsus	"	"
June 30	L. M.	" 25 Caries of ankle	"	"
Aug. 8	D. M. E.	" 45 Smash of both feet	"	Death traumatic fever.
Oct. 14	R. S.	" 14 Smash of foot	"	Well

Three Amputations at Ankle.

April 10	J. J. aged 16	Smash of foot	Syme	Death
Aug. 10	K. M. D.	" 29 Caries of tarsus	"	Well
Sept. 12	A. B.	" 8 Smash of foot	(Seedy. operation)	"

Two Partial Amputations of Foot.

May 20	D. B.	aged 16.....	Caries of internal cunif. and 1st metatarsal .....	.....	Amputation.....	Well
Oct. 2	J. M.	" 8.....	Disease of metatarsal bone	"	"	"

Amputations of Toes.

5, Well.

One Amputation of Arm.

Sept. 28	H. S.	Disease of elbow joint, and caries of articular end of humerus	Well
----------------	------------	-------	--	-------	-------	------------

One Amputation of Fore-arm.

June 9	D. C.	aged 22.....	Smash of fore-arm	Amputation below elbow.....	Well
--------------	------------	--------------	-------------------------	-------	-----------------------------	------------

One Partial Amputation of Hand.

Aug. 28	W. M. A.	aged 19.....	Smash of hand	Amp. thumb, index, and middle through carpo-metacarpal joint	Well
---------------	---------------	--------------	---------------------	-------	--	------------

Fifteen Amputations of Fingers.

All well.

Seven Cheilo-Plastic Operations.

Jan. 13	J. M. H.	aged 4 mo.....	Double harelip .....	.....	.....	Well
" 10	F. P.	" 12 yrs.....	Harelip.....	.....	.....	" .....
Feb 28	J. W.	" 28 "	Gunshot wound of face .....	.....	.....	Improved.....
May 23	J. N.	" 5 mo.....	Double harelip .....	.....	.....	Well
July 9	J. M. G.	" 11 "	Double harelip .....	.....	.....	" .....
Sept. 22	K. M. D.	" 15 yrs.....	Cleft palate.....	.....	.....	" .....
July 8	T. J.	" 42 "	Epithelioma on lower eyelid .....	.....	.....	" .....

Twelve Excisions of Tumours.

Jan. 19	A. H.	aged 42	.....	Scurrhus of breast	.....	Excision	.....	Well	.....
Feb. 14	D. B.	" 50	.....	Epithelioma on lip	.....	"	.....	"	.....
Mar. 20	A. M.	" 76	.....	" " on cheek	.....	"	.....	"	.....
" 19	C. M.	" 62	.....	Tumour	.....	"	.....	"	.....
June 9	A. W.	" 53	.....	Epithel. on face	.....	"	.....	"	.....
May 20	J. D.	" 19	.....	Adenoma in Submy. region	.....	"	.....	"	.....
June 22	A. M-K.	" 46	.....	Scurrhus	.....	"	.....	"	.....
July 2	M. R.	" 55	.....	Cancer of Tongue	.....	"	.....	"	.....
" 22	D. B.	" 3 mo. ..	.....	Epulis	.....	"	.....	"	.....
" 24	M. M-C.	" 53	.....	Cystic tumour on neck	.....	"	.....	"	.....
" 28	J. C.	" 52	.....	Spindle celled sarcoma	.....	"	.....	"	.....
	J. M-L. ....	.....	.....	Enceph. tumour on scrotum	.....	"	.....	"	.....

Intl. jugular wounded.

One Excision of Tongue.

April 17	A. W.	aged 50	.....	Epithelioma of tongue	.....	Excision of half	.....	Well	.....
	"	"	.....	"	.....	"	.....	Re-excised	.....

One Excision of Elbow.

Sept. 20	J. H.	aged 15	Strumous arthritis	Excised	Well
----------	------------	---------	-------	--------------------	-------	---------	-------	------	-------

Three Excisions of Necrosed Bone.

Dec. 4	W. E. ....	.....	.....	Necrosis of os calcis	.....	Triangular piece removed	.....	Well	.....
May 5	M. J. ....	.....	.....	" " of ramus of jaw	.....	Removal of sequestrum and triangular piece	.....	"	.....
" 18	J. H. ....	.....	.....	" " of tibia	.....	Removal of sequestrum	.....	"	.....

Two Cases of Hydrocele.

June 9	J. R. ....	.....	.....	Hydrocele	.....	Tapped and injected	.....	Well	.....
	J. H. ....	.....	.....	"	.....	"	.....	"	.....

Two Cases of Strangulated Hernia.

Oct. 2	W. A. ....aged 48 yrs...Strang. Inguinal	Death	Peritonitis.
May 12	D. C." 10 mo... Congenital	Well	

One Case of Radical Cure for Hernia.

Jan. 26	D. C. ....aged 27.....	Wood's operation	Well
---------------	------------------------	------------------------	------------

Three Cases of Lithotomy.

Feb. 11	A. I. ....aged 76.....	Rectangular	Well
May 12	J. S." 5.....	"	"
Aug. 6	J. B." 3.....	"	"

Five Cases of Fistula.

Feb. 11	T. W. ....aged 30.....	.....	Well
April 1	H. C." 44.....	.....	" .....
May 30	D. W." 23.....	.....	" .....
July 29	R. J." 45.....	.....	" .....
" 28	G. H." 25.....	.....	" .....

Two Cases of Ligature of Piles.

Both well.

Fifteen Dislocations Reduced.

Sciatic notch	1 well.....	
Shoulder ..	9 "	1 had been dislocated three weeks.
Radius forward	1 "	
Thumb	2 "	
Finger	1 "	
Jaw unilateral	1 "	

Two Cases of Phymosis slit up.—Well.

V.—SURGICAL PRACTICE IN THE WESTERN INFIRMARY, FROM 1st NOV., 1874, TILL 1st MAY, 1875.

By GEORGE BUCHANAN, M.A., M.D., *Professor of Clinical Surgery in the University of Glasgow, &c.* Compiled by DR FOULIS, *late House Surgeon.*

THE following report contains an analysis of the cases under Professor George Buchanan's care in the Western Infirmary, Glasgow, during the first winter session after the wards were opened.

The session began under unfavourable circumstances, in so far that the first clinical lecture was given with empty wards. The influx of patients, however, proved so great that in a short time the difficulty came to be to find beds for the numerous applicants; while, as the list of operations will show, the operating theatre was busily occupied.

Referring in the first place to the total cases, we find the number of females treated to be 40; males, 136=176 indoor. Of these, 3 females and 8 males died—6·2 per cent.—1 in 16. The fatal cases were as under:—

1. Mrs F., aged 32. Admitted Nov. 6, with cancer of rectum in an advanced stage. Patient had been sent into the Infirmary without previous notice, and, having been provided with a bed, she died before arrangements were completed for her return home.

2. A. W., age unknown. Picked up in street. Admitted Feb. 26, insensible. Unequal pupils; hemiplegia sinistra; stertor; small pulse. Died the same evening. On *post-mortem* examination, the right lateral ventricle of brain was found full of blood clot, and blood was effused in the sub-arachnoid space on the hemispheres.

3. Mrs B., aged 30. Hurt by a shaft in a mill, revolving 120 per minute. Admitted March 2, in a bruised condition. No bones fractured; pulse 100, small; breathing 24, quiet; pupils equal. Left side of scalp converted into a fluctuant bag, but no fracture of bone. Patient rallied, and seemed better next day; was sensible till shortly before death, which took place at 5 P.M. Examination of body revealed rupture of bowel at junction of middle and upper thirds of ileum. Peritonitis, which, in consequence of the generally contused state of the woman, had not revealed its presence by special signs.

4. P. F., aged 36. Admitted Nov. 18, with the whole of the left arm stripped of skin and subcutaneous fat down to the muscles, by phlegmonous erysipelas. Emaciated and feverish. Amputation at shoulder was performed, but patient proved unable to rally thoroughly, and died on the ninth day. The wound at the shoulder nearly healed.

5. F. S., aged 50. Struck by a plank falling on the head. Admitted Nov. 20, insensible. Pupils dilated; cornea not sensitive to touch; pulse 80, hard; steady bleeding from left ear. Died two and a half hours after admission. On *post-mortem* examination, a comminuted fracture of left temporal bone. The fracture extended to the foramen magnum. Contused state of brain at seat of fracture, and also at opposite side of brain, where no fracture of bone existed.

6. G. P., aged 73. Admitted Nov. 26, at 10.30 P.M. Hernia, reduced under chloroform; old standing bronchitis; weakness. Death eleven hours after admission from exhaustion.

7. A. A., aged 20. Admitted Dec. 1. False joint in great toe, resulting from an excision of the joint. Amputation was performed by Dr Foulis, and the wound healed fairly, but an exacerbation of latent phthisis carried patient off in a month.

8. J. K., aged 20. Fell from a scaffold 15 feet. Admitted Dec. 17, insensible. Pupils large, not reacting to light; pulse 48, compressible; breathing 32, laboured; every now and again a deep sigh; urine passed in bed, deeply tinged with blood. Patient never rallied; vomiting occurred; stertor ushered in death ten hours after admission.

9. D. M'K., aged 20. Fell from a scaffold 20 feet. Admitted March 2. Compound fracture of femur; pupils unequal; pulse 64, compressible; senses clear; arms and legs paralysed; a little sensory power in upper arms and shoulders; an intensely painful spot at 5th cervical spine; breathing 18, irregular, abdominal; micturition suspended; bowels not moved; vomiting afterwards occurred. Death on the 5th day after admission.

10. J. R., aged 45. Admitted March 20. Otitis of five months' standing. An exploratory examination under chloroform showed that nothing could be done. The state

of patient got worse, and death took place a week after admission. At the *post-mortem* examination, the petrous bone was found perforated, and the whole internal ear a disorganised mass. The brain above and near the perforation was softened, and the base the seat of acute inflammation.

11. J. M., aged 57. Fell 30 feet on to some chains. Admitted April 3. Compound comminuted fracture of humerus; simple fracture femur; Pott's fracture; pupils unequal; senses clear; contusion on left side of forehead; great pain generally over body. Patient sank, and died 36 hours after admission.

It will be seen from the foregoing that some of the cases in the wards have been of great severity and interest.

Turning to the successful side of the picture, there have been 67 operations under chloroform, with two deaths (related above, cases 4 and 7). The average amount of chloroform given was $1\frac{1}{2}$ oz. to each operation. The administration was conducted by the dressers in rotation, under the direction of the House Surgeon. The apparatus used was the ordinary helmet-shaped flannel mouthpiece. Esmarch's elastic band was used as a tourniquet, without the preliminary bandaging of the part, which was raised and gently shampooed for a little before applying the band. From January onwards the "catch" for the tourniquet (described in this *Journal*, January, 1875) was uniformly used, and found to facilitate the application of the band. Advantage has been taken of the proximity to the University to summon the students for the cases which came in in the afternoon, and which could not wait. This was done in the case of strangulated femoral hernia, when a large number of students were enabled to witness an operation which they would otherwise have missed seeing.

There have been three cases of opened joints, all of which have ended incurable. The first of these, H. M. N., aged 22, admitted November 2, with a stab opening the wrist joint from behind, was treated with rest, fomentation, and cleanliness. Incisions were freely made from time to time to favour discharge; and on Jan. 17 patient was dismissed with the hand quite healed. The bones of the carpus at one time grated on

each other to such a degree that amputation was almost decided on, but a continuance of the treatment resulted in a cure. In the second case, William R., aged 29, admitted Dec. 30, with intense inflammatory disturbance spreading up the arm, following on a prick with a pin on the little finger, antiseptic dressing was followed out, with the use of drainage tubes. Seven incisions, at various points in the palm and wrist, were made during the progress of the case. Here, too, the bones of the carpus grated freely, but in six weeks the patient was sent out with the wound quite healed. In the third case, P. H., aged 45, admitted March 5, with necrosis of end of middle metacarpal bone, resulting from a burn, the end of the affected bone was excised. The joint thus opened gave no trouble, and in three weeks the patient left the Hospital, with a small granulating surface at the seat of operation. The dressing in this case was lint soaked in 1:20 carbolic oil.

Three cases of cut-throat have been treated. M. W., aged 61, admitted Nov. 30, with transverse cut just above the thyroid cartilage, three inches long, and gaping widely. The finger could be laid upon the false cords. The two extremities of the wound were sewn up, the centre being left free. Patient was unable to swallow, but was fed twice a day by the stomach pump, passed by the mouth—the dressers taking the duty in rotation. Under this treatment patient got rapidly well, and left January 28, with a small fistula at the site of the wound, having survived a sharp attack of erysipelas of the face, which occurred during the progress of the case. The second case, J. M., aged 38, admitted November 20, with transverse wound $\frac{1}{2}$ inch below hyoid bone, and two inches long, opening into larynx. Under water dressing the wound healed kindly, and patient left on December 29.

The third, J. C., aged 38, admitted April 13. Cut extended from an inch and a half below the left ear, to two inches on the right side of the median line. The two extremities of the wound were drawn together by sutures, but the central part was left open. Patient dismissed well on the 30th April.

An interesting case of cicatricial contraction of the mouth is still under treatment. E. G., aged 13. Admitted March 29. The history is very obscure ; but on admission the inner margins of the lips were found drawn together by a circular scar, which left a round opening just sufficient to admit the point of the finger. The scar was closely adherent to the gums. Lateral incisions were made, and two hooks, coated with guttapercha, and connected by an elastic band passing behind the head, were used to drag asunder the angles of the mouth.

The two lithotomy cases noted in the operation list deserve notice. In the first, J. C., aged 72, admitted Dec. 10, 1874, with recurrence of stone after lithotomy, Dec. 3, 1873, a round phosphatic stone was removed by the rectangular method. Slight oozing occurred after the operation, necessitating plugging; recovery took place, patient leaving two months after with the wound closed.

The second case, J. G., aged 57, admitted February 2, is rendered interesting by the history of the formation of the stone. Two-and-a-half years before admission painless hæmorrhage from bladder occurred, and had recurred at intervals after. Around two of the clots left in the bladder a deposit of uric acid had taken place, and the successive recurrences of the hæmorrhage had tended to coat the forming stones with flocculent soft matter, thus mitigating symptoms, and by means of the flocculi soliciting further deposit. The uric acid is disposed accordingly in loose layers, with minute interspaces, round a half-dried clot, as shown on section. The stones are facettèd. The weight is 2 oz. The symptoms of stone were only recently developed, since December, 1874. The operation by rectangular staff was followed by oozing, checked by plugging, and subcutaneous injection of ergotin (5 m.); and recovery took place, only interrupted by recurrence of oozing at 6th day: checked as before. Patient left March 23, the wound almost closed up.

There were nine major amputations, six of these being on the thigh. Among these there was only one death, that

of the man admitted with phlegmonous erysipelas and sloughing of the whole arm, necessitating, as a measure of relief, amputation at the shoulder.

Among the ulcers, there was one which attracted attention, from the great increase in the length and thickness of the tibia and fibula caused by it. F. H., aged 14. Admitted Dec. 1, with an ulcer 6 inches long by 4 inches broad on the front of left leg, of 5 years' duration. The left leg measured, from lower edge of patella to internal malleolus, $1\frac{1}{2}$ inches more than the right, and the limb was thickened in proportion. The femora were equal in length and size. Under treatment the ulcer diminished gradually to about the size of a crown piece, when progress, which had been slow of late, ceased. Skin grafting was resorted to, and the grafts, 12 in number, all took. The ulcer seemed to be healing for a fortnight after, but again the edges ceased to grow, and the ulcer enlarged. The cicatrisation had to proceed over an oblong mound of bone, over which the new skin was stretched, tense and shining. It was evident that this must be removed: and on April 6, a crucial incision having been made, the flaps with the periosteum were dissected back, and the oblong mound of bone removed with a Graham's saw. It measured 4 inches long by $1\frac{1}{2}$ inches broad and $\frac{1}{2}$ inch thick, a localised growth, and evidently due to the irritation of the ulcer. Healthy granulations have sprung up over the surface of the excised portion of bone and cicatrisation is advancing rapidly.

The out-patients applying for advice in the ward have been 37 in number. There have been the usual amputations of fingers: the only point to notice in these has been the rigid observance of the rule never to remove a particle of any finger in a working man when it could possibly be avoided. In some cases the torn fragments of skin have been simply brought together over the end of the bone, and useful joints have thus been saved to the patients. The first phalanx was invariably left, and even when part of the first phalanx was removed, the stump was left. The results have been quite satisfactory.

TABLE OF OPERATIONS BY PROFESSOR GEORGE BUCHANAN,
FROM 1ST NOVEMBER, 1874, TILL 1ST MAY, 1875.

		<i>One Amputation at Shoulder.</i>			
Date.	Age.	Patient.	Phlegmon and gangrene of arm -	Flap from deltoid	Death.
Nov. 20	1874	P. I.	aged 37		Exhaustion
<i>Four Amputations of Fingers.</i>					
All successful.					
<i>Six Amputations of Thigh.</i>					
Dec. 3	1874	J. B.	aged 23	Smash of leg	Carden's amput. through condyles, secondary.
Feb. 24	1875	C. G.	" 29	Old ulceration and distortion of leg	Carden's amput. at knee
Mar. 3	"	M. W.	" 36	Disease of knee joint	" "
" 3	"	C. F.	" 48	" "	" "
" 4	"	G. S.	" 38	Cancer of end of femur	Amput. at middle of thigh
Apr. 23	"	J. M. K.	" 27	Disease of knee	Carden's amput.
<i>Two Amputations at Ankle.</i>					
Jan. 30	1875	J. F.	aged 16	Caries of tarsus	Syme's, at ankle
Feb. 24	"	J. S.	" 17	" "	" "
<i>One Amputation of Great Toe.</i>					
Dec. 1	1874	A. A.	aged 20	Loose joint after excision	Amputation
<i>Four Excisions of Joints.</i>					
Feb. 3	1875	S. D.	aged 5	Disease of elbow	Excision of elbow
Mar. 10	"	H. C.	" 14	" "	" "
" 29	"	A. M. G.	" 17	" wrist	" "
" 24	"	W. S.	" 10	Old dislocation of, and fracture near elbow	wrist elbow

{ A month after from acute phlebitis.

Ten Excisions of Bone.

Necrosis of humerus	-	-	Sequestrum removed	-	Improved
" "	-	-	" "	-	Successful
" os calcis	-	-	" "	-	"
Pain of knuckle	-	-	Excision of end of metatarsal bone	-	"
Ulcer over os calcis	-	-	Excision of os calcis	-	Improved
Ulcers on tibia	-	-	Crushed surface of tibia	-	"
Superficial necrosis of fibula	-	-	Removal of necrosed scales of bone	-	Successful
" " tibia	-	-	" "	-	"
Exostosis on tibia	-	-	Excision	-	-
Necrosis of tibia	-	-	" "	-	Successful

Three Excisions of Mammary.

Fungating acute scirrhus	-	-	Excision of mamma	-	Successful
Scirrhus of mamma	-	-	" "	-	"
" "	-	-	" "	-	"

Lithotomy—Two Cases.

Stone in bladder	-	-	Rectangular	-	Successful
" "	-	-	" "	-	"

One Hernia.

Strang. fem. hernia	-	-	Opening Sac	-	Successful
---------------------	---	---	-------------	---	------------

One Ligation of Artery.

Lacerated wound of radial	-	-	Tied above and below	-	Successful
---------------------------	---	---	----------------------	---	------------

Tenotomy—Five Cases.

Talipes varus	-	-	Tenotomy	-	Successful
" equinus	-	-	" "	-	"
" varus	-	-	" "	-	"
" "	-	-	" "	-	"
" equinus	-	-	" "	-	"

Six Fistulae.

All cured by incision.

N. Y.	7,	1874	D. M. C.	aged 25
Jan.	5,	"	J. P.	" 23
Feb.	29,	1875	J. G.	" 8
Mar.	10,	"	P. H.	" 45
"	13,	"	H. M. E.	" 22
"	17,	"	C. M. K.	" 24
"	31,	"	M. D.	" 12
"	31,	"	J. F.	" 9
Apr.	6,	"	T. H.	" 14
"	13,	"	W. M.	" 7

N. Y.	6,	1874	Mrs R.	aged 40
Jan.	17,	1875	J. F.	" 49
Feb.	19,	"	J. J.	" 55

I. C.	16,	1874	J. C.	aged 72
Feb.	13,	1875	J. G.	" 57

Mar.	19,	1875	M. J.	aged 43
------	-----	------	-------	---------

Apr.	1,	1875	D. M. G.	aged 14
------	----	------	----------	---------

Dec.	11,	1874	H. M.	aged 5
Jan.	27,	1875	A. B.	" 9
Feb.	27,	"	J. K.	" 7
Apr.	19,	"	C. B.	" 4
"	13,	"	W. M.	" 7

VI.—NOTES ON PNEUMONIA: BASED ON SIXTY-FOUR CASES OF THAT DISEASE OBSERVED IN PRIVATE PRACTICE.

By THOMAS BARR, M.D.

THE study of Pneumonia presents many points which render it specially attractive to the medical practitioner. Perhaps it is, of all diseases, pre-eminently the one respecting which controversy has been keenest at all periods in the history of medicine. It may be considered the type of acute inflammations, and was therefore the disease against which our forefathers most vigorously directed their anti-phlogistic weapons. The study of the natural history of disease has in Pneumonia, as in other acute inflammations, resulted in a deep-rooted medical scepticism as to the value of these once much trusted remedies of our ancestors. Tables have been constructed, statistics carefully compiled, founded upon large numbers of cases the natural courses of which were accurately observed, with the result that this disease, which was held in such dread by the practitioners of the past, is one in which, given a previously healthy adult, a favourable termination may be safely prognosed under the most simple treatment.

Hitherto hospital practice has yielded the great bulk of statistical information regarding Pneumonia. Perhaps Dr Bennett's cases, observed in the wards of the Edinburgh Infirmary, have contributed more than anything else to the abandonment of the heroic treatment, and the adoption of the restorative. However valuable such statistics are, opinions of disease or plans of treatment arrived at as the result of personal experience, limited as that may be, are much to be preferred, and should be the aim of every observer of disease.

I have thought that an analysis of a number of cases of Pneumonia observed in private practice, without any selection, might present some advantages, and might be productive of information in some respects more valuable than a similar number of hospital cases, limited as they are to adult age.

The following 64 cases have been taken from my general record of daily practice during a period of sixteen months, and embrace all the instances of Pneumonia which came under my observation during that time. The frequency of the occurrence of the disease in general practice is an interesting question. I find that the proportion to all my other cases during that time has been one in twenty, or five per cent., so that in my experience of these sixteen months, for every twenty patients whom I have been called to see, one has been suffering from inflammation of the lungs. It is therefore a common malady, and although, in adult life, not a highly fatal one, it always excites in the minds of the patients and their friends a great deal of anxiety—the symptoms being to them very alarming—and in the event of the attack falling upon the head of a family, the bread-winner, the suffering and injury to dependants must always be very serious.

The influence of the season of the year upon the prevalence of the disease is indicated by the number for one year, beginning with April, 1874.

April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
4	6	7	1	3	3	4	4	11	3	5	6

It will be observed that there is not that marked disparity between its prevalence in the cold as compared with the temperate months which might have been expected—that it does not prevail much more extensively in the winter than in the summer months.

My cases show a most marked preponderance of the male sex. Of these 64, 48 were males, and only 16 females. This must be due, in great part, to the more frequent exposure of the male sex to the causes which are likely to produce inflammatory disease of an internal organ, such as sudden changes of temperature, clothing insufficient to resist the low temperature which so often prevails in Glasgow, sudden exposure of a heated perspiring surface to the external air with no precautions of additional dress. The preponderance of the male sex is still more strongly shown in the

patients whose ages were between 10 and 50 years. Of these numbering 33, only five were females. This very great difference in the relative frequency of the disease in the two sexes is a fact which favours the view that the disease is simply a local inflammation—giving rise to great symptomatic fever, and not, as some hold, a blood affection, the local disease—the exudation into the air cells—being nature's mode of curing and relieving the morbid condition of the blood.

The influence of age is a most important consideration. The following table indicates the various ages at which my cases occurred:—

Under 2½ years.	Between						Total.
	2½ & 5 yrs.	5 & 20 yrs.	20 & 30 yrs.	30 & 40 yrs.	40 & 50 yrs.	50 & 62 yrs.	
15	7	17	6	6	9	4	64

The greater liability of children during the period of the first dentition is decidedly shown in this table. The susceptibility of the bronchial mucous membrane to external impressions at that time is at its maximum, and we all know the tendency of inflammation occurring in the bronchial tubes of children to extend to the air vesicles, producing Broucho-pneumonia—Catarrhal-pneumonia limited to a lobule or to groups of lobules. Lobar-pneumonia, however, in the infant, is far from being uncommon. In such cases I have been much struck by the length of time which intervenes between the appearance of the first symptoms of illness and the manifestation of physical signs indicating a pulmonary affection. An infant takes ill very suddenly with symptoms which appear very alarming—high fever, inability to suck, persistent vomiting (this symptom I have rarely found absent), frequent moaning, dilating nostrils, an occasional cough, accompanied by crying, as if from pain. Day after day the chest is carefully examined by auscultation and percussion, and no definite sign is discovered, unless it be sometimes a comparative feebleness of the vesicular murmur at some part. Perhaps about the fifth or sixth day whiffing tubular metallic breathing is heard, with distinct super-

ficiality in the breath sound—rarely at this stage any crepitus—also increased resonance when the child cries, and some slight dulness on percussion, never, however, well marked dulness. These signs confirm our suspicion of the existence of pulmonary inflammation.

To the young practitioner these cases must often prove puzzling. The most prominent symptom—the constant vomiting—and the absence of physical signs in the lungs for so long a time after the beginning of the illness, are likely to mislead the medical attendant, and the clamorous demands on the part of patients' friends to know the name of the disease, add to the discomfort of the doctor.

After the age of five years, the various numbers are pretty equal in the advancing decades. As we shall see in the course of this paper, the influence of age upon the mortality is extremely marked.

The Topographical Seat of Pneumonia.—The comparative frequency with which different parts of the lung are affected by the disease in these cases is indicated by the following numbers:—Right basic, 34; left basic, 25; apex, 5, of which 3 occurred in left and 2 in right apex. The greater frequency of right basic pneumonia is familiar to every medical man, and the proportion of my cases is what might be expected. The number affecting the apices of the lungs—one in thirteen of my cases—is perhaps a larger proportion than has generally been considered the usual ratio. The view that there is special danger in pneumonia affecting the upper lobe has been strongly insisted upon by some physicians, especially by Louis. The likelihood of its being tubercular in its nature when it involves that part of the lung is considered by him to be very great. My cases are, to some extent, confirmatory of that view. One of the patients, a boy of three and a half years, had three separate attacks of the disease in the right apex—the last case being in May, 1874. In March of this year he died from tubercular meningitis. Another was a boy of the same age, and the pneumonia was also in right apex. Imperfect recovery took place, and ultimately death,

evidently from tubercular infiltration of the lung. The other three cases occurring within the past year, and all affecting the left apices, are at present apparently well; their respective ages are six, twenty-two, and forty-two years. The course of the disease in each of these three patients was quite normal, and perfect recovery appeared to take place.

The Mortality in Pneumonia has been most variously stated by different authorities. While some writers give a mortality of one in three, others, and especially recent ones, show a proportion of only one in thirty. But a tabular statement of deaths from this disease is of no value unless considerations of age, sex, constitutional peculiarities, complications with other diseases, and previous health of the patients, are carefully taken into account. In these sixty-four cases there have been eleven deaths, or about one in six. When one reads the statistics of hospital writers respecting this disease which have of late years been published, it requires not a little courage for a private practitioner to announce that he has had a mortality of one in six. But, supposing I selected my cases, and gave those only between the ages of six and fifty years, the ratio of deaths would be one in twenty-one, while of the forty-two cases between five and sixty-two, only two deaths took place.

It will, I think, be interesting and important to enter more particularly into those cases which ended in death, and see if any lessons may be learned from them. First, of the two adults who died—J. M. took ill on the 10th of Sept., 1874, with shivering, headache, and vomiting. Saw patient on the eleventh,—brown tongue—great pyrexia: but the most bitter complaint was that of intense headache. The day following pain in head still intense, but now rusty sputum, cough, and right basal crepitation, but no pain in chest. Treated with tartar emetic and leeches. Headache relieved, but furious delirium set in, which increased until it became perfectly maniacal. Sedatives such as chloral and Battley were used, but with no effect. These cerebral symptoms continued for a week, and then passed

off; but the pulmonary symptoms continued, with progressive emaciation and great nervous depression. After a short time gangrenous odour from breath, and ultimately death seven weeks after seizure, evidently from gangrene of lung. This man had been of quite temperate habits, but had always been preternaturally nervous, with trembling hands, and morbid excitability of temper. Of all my cases this is the only one I leached, and one of the very few to whom I gave anything like antiphlogistic doses of antimony.

The other adult was a man forty-five years of age—a brewer's drayman—who had for fifteen years been in the habit of taking large quantities of raw spirits every day. He died in a few days from rapid failure of the heart's action. When I saw him, three days after beginning of illness, his pulse could not be counted, extremities cold, and symptoms of rapid sinking. Chronic alcoholic poisoning was clearly the cause of this fatal result.

In the nine cases of children under five years of age, who died previous to the onset of the disease, there was, without exception, some debilitating influence at work in the system. M. F., five years old.—In this case pneumonia supervened during acute Bright's disease after scarlatina. M. M., one year and eight months, was brought up on bottle, and very delicate, while the pneumonia was complicated with measles. M. S., fourteen months, pneumonia complicated with bronchitis, and occurring after a long course of hooping cough. A. W., three and a half years, right apex affected, and leading to tubercular infiltration of lung, as already mentioned. T. M., two years, had been the delicate child of the family. The remaining four children were all decidedly suffering from the rickety diathesis when attacked by the disease. These cases thus show very clearly the influence of age and previous health upon the mortality from the disease. As has been said by a recent author, "there are periods of life at which it is next to impossible to save; and there are periods of life at which it is not easy, with common prudence, to lose a sufferer from idiopathic pneumonia."

In children, constitutional tendencies, or, as they are called, the diatheses, are the great factors in the production of fatal results. No doubt we sometimes see acute inflammation of an important organ speedily destroying life in a child previously healthy; but I think that constitutional peculiarities, such as the tubercular, the strumous, the rickety diatheses, interfering as they do with the natural tendency of the disease to recovery, are the most common causes of death in acute inflammation in the child. No doubt many of my cases have to a very considerable extent occurred in children exposed to the numerous causes of constitutional weakness, namely, bad air, inattention to cleanliness, want of suitable nourishment, and insufficient protection against cold, so that I have rarely employed measures which tended to lower the vital powers. I am convinced, from my study of these cases of death, that in none of them did the inflammation occur in a person previously strong and healthy; and my observation of the disease has led me to the conclusion that pneumonia occurring in an adult of previously good health, of temperate habits, and free from complications, is a disease which will very rarely indeed have a fatal termination.

The last point in connection with these cases is the question of treatment.

1st. I have never employed general blood-letting, and, with the exception of the man who died from gangrene of the lung, I have never used even leeches. I think few of my readers will consider that in my cases of death the fatal result would have been prevented by depletion.

2nd. I have in a few employed antimony in what might be called antiphlogistic doses. I generally used it for its expectorant and diaphoretic effects, and have very rarely used it at all with children under five years of age. I very often find patients suffering from the disease, with an irritable stomach, perspiring skin, and soft pulse. In strong adults, with very acute symptoms, and none of these contra-indicating signs, I have used it in full doses with great advantage.

3rd. Mercury. I have not used this medicine at all unless as a simple aperient.

4th. Opium. I think I have seen more good done by this drug than by any other single remedy. It gave comfort to the patient, relieving pain and allaying cough.

5th. Diaphoretics and expectorants have been given with advantage. These classes of remedies also include small doses of opium and tartar emetic.

6th. External applications. At early stages I have found most comfort from poultices of linseed meal and mustard, frequently repeated; while blisters were reserved for the more chronic stages, when the condensation of lung seemed to linger longer than usual.

With respect to the treatment of the children in whom the most of my fatal cases occurred; with the belief which I entertain of the real cause of danger, I have only adopted the restorative treatment. I have altogether eschewed bleeding, antimony, mercury. I have, of course, carefully confined the patient to a well-ventilated apartment (he requires all obtainable oxygen), with a comfortably warm temperature, given liquid-diet, milk being the staple. If an infant at the breast, I limited its supply of breast milk, and rather relieved its thirst by administration of cold barley-water—in the way of medicine, giving a diaphoretic mixture, small doses of ipecac. wine, sweet spirits of nitre, tincture of hyoseyamus and solution of acetate of ammonia. Good has been done by allowing boiling water to evaporate near patient. Repeated linseed-meal and mustard poultices to back and front of chest have often done great good. As night approaches the little patient often becomes very restless, annoyed by a constant hacking cough. Then I have often found the greatest benefit from a dose of Dover's powder, preferring to give one single full dose at night to small ones frequently repeated. Of course, if the case is complicated, with pent-up secretions in the air-tubes, I have avoided the Dover's powder. When the child is feeble, great benefit is derived from liniments to the chest, while beef-tea and brandy were often absolutely necessary to

uphold strength till the patient passed through the crisis of the disease. A great authority* says,—“It is but rarely at the present day that depletion is indicated in bronchitis or pneumonia, and tartar emetic needs to be given more sparingly than in former years, and acts with less certainty in cutting short at its very outset the inflammatory attack. I believe that with advancing years all practitioners become disposed to attach more importance to the hygiene of the sick room—to the temperature of the air which the child breathes—to the perfection of the ventilation—to the posture of the patient in bed—to the regulation of the diet, the avoidance of all causes of irritation and distress; and the favourable issue of the case not seldom justifies the apparent over-caution in these respects to which experience seems to lead.”

VII.—A TYPHOID EPIDEMIC, APPARENTLY ARISING FROM INFECTED MILK.

By ALEXANDER OGSTON, M.D., Aberdeen.

JANE R—, aged 17 years, a native of Ross-shire, was employed as a domestic servant in a house in North Charlotte Street, Aberdeen, during September and October, 1874. The inmates of the house were all healthy.

In the beginning of November she left that house, and resided with and nursed Mrs C., No. 26 Union Row, Aberdeen. This Mrs C. was suffering from a low feverish attack, lasting eight weeks, but had no diarrhoea or abdominal pains. Jane R. attended to her for three weeks, at the end of which time she was complaining of “feverish cold.”

On the 26th November she left Mrs C., and went to be a domestic servant at Whitemyres, a country house three or four miles from Aberdeen. Within a few days she was there taken seriously ill, and on the 8th December she came into Aberdeen for treatment. The interest of the case hinges upon her condition at Whitemyres, but no further information could be obtained concerning that. Hence we shall follow out her

symptoms and history after she left Whitemyres, and, aided by the information thus obtained, return to Whitemyres further on.

On the evening of the 8th December, the day of her leaving Whitemyres, she went to her sister's house in Aberdeen. She remained there forty-five hours in a delirious, almost unconscious state, with dry, brown, and cracked tongue, and *passing frequent and abundant peasoup stools*. Her sister sent for a medical man, who found her too confused to give a proper account of herself, and, stating she had *typhus* fever, advised her removal to the Infirmary.

She was taken to the Infirmary on the 10th December, and her disease was there entered on her card as *typhus fever*. Neither her temperature nor notes of her case were taken, but she was delirious the whole time, was said to have had *typhus spots*, but *typhoid (peasoup) stools*, and died on the 17th December, 1874. There was no *post-mortem* examination.

To return to Whitemyres. If, as seems highly probable, Jane R. was, at the time of her residence there, suffering from typhoid diarrhœa, the only place she could have frequented was the privy of the establishment, a small building standing by itself, in which the urine and fæces of the frequenters dropped into a small ashpit about a yard square and one foot deep. This ashpit stood on the top of a bank three feet from a stream of running water, and drained into the stream by a short partly-piped, partly-built drain.

The stream of running water was a roadside stream, about six inches wide and two inches deep, arising from a spring a mile further up country, but receiving no sewer above this. It was also fed by the drains of the surrounding arable land, and after passing Whitemyres received, half-a-mile further down stream, a half-choked drain from a house (and ground soaked with sewage) where no illness had existed. What it received from this drain was very insignificant in quantity. Continuing its course, the stream ran at the roadside past the gate of the dairy farm of the Oldmill Reformatory School. At this place, less than a mile from Whitemyres, the stream was dammed up, and allowed to flow off through a spout.

The dairy farm of the Oldmill Reformatory School supplies milk to its own institution, and to a large number of the inhabitants of Aberdeen. The dairy arrangements were perfect, excepting the water supply. The water came from two sources, a spring well, pure and unimpeachable, and the roadside spout, whose origin we have traced above. The roadside water was used for scullery purposes, and the spring water, which had to be carried by hand from a distance of a quarter of a mile, was used for cleaning the vessels employed for storing and transporting the milk. Both these waters, when being used, were heated in one single fixed boiler, used indifferently for each, and without assuming intentional negligence, it was readily conceivable that some of the roadside water might have been left in the boiler, or otherwise have got mixed with that used for cleaning the milk vessels. The water, though heated, was not necessarily boiled before being used. The vessels for transporting the milk were tinned flagons, with narrow necks: the larger were dried out after being washed, the smaller did not admit the hand, could not be dried out, and after being washed each still contained a teaspoonful of water. This peculiarity may serve to explain the fact that the inmates of the institution suffered so little, as the small flagons were used for cream or special milk, and therefore went almost entirely to supply the town consumers.

Shortly after Jane R. left Whitemyres, an epidemic of typhoid fever broke out in some of the healthiest and best quarters of Aberdeen, and a case or two simultaneously occurred among the officials of the reformatory. The cases did not occur in any particular district, but attacked families, or members of a family, here and there in the wealthiest quarters of the town. The children were the greatest sufferers. The cases were mostly in the private practice of the talented medical attendant of the reformatory, who, knowing the excellence of the reformatory milk, had been in the habit of recommending it to his patients. He soon discovered that the disease was, almost without exception, limited to the families supplied with the reformatory milk, and that, of all those so supplied, a very large proportion had the disease.

By the direction of the managers of the reformatory, I was associated with him in investigating the cause of the epidemic, and after a most careful inquiry, extending to every conceivable channel of infection, we could come to no other conclusion than that Jane R. had been the cause of the epidemic.

VIII.—OPERATION UNDER CHLORAL HYDRATE.

By J. S. NAIRNE, L.F.P.S.G., and ALEX. NAIRNE, L.R.C.P.E.

ON the 2nd April, 1875, Christina D—, 3 years old, a delicate-looking child, was put under the influence of chloral, and had the third metatarsal bone of her left foot removed for disease.

There is nothing to note about the operation, but the narrative of the administration of the chloral may be interesting.

An aqueous solution of chloral was prepared, of which 20 minims contained 12 grains, and we had also at hand a solution of strychnia of two grains to the ounce.

At 10.30 a.m., ten minims were injected subcutaneously into the right lower leg.

10.38. No perceptible effect ; child crying continuously.

10.40. Ten minims more injected, and the child given to its mother to carry about.

10.45. Drowsy, but easily roused ; starts and cries suddenly, and as suddenly ceases.

10.55. Ten minims more injected into left lower leg ; sleeps quite soundly ; no flushing of face ; wakes in a moment and is asleep again in a moment.

11.5. Ten minims administered by mouth ; begins to snore ; pinching makes her cry, but she sleeps immediately.

11.15. Ten minims more administered by the mouth.

11.20. Seems now in a deep sleep ; pinching does not awake her.

The operation was now performed. During its performance she began to cry, but made no struggling ; the eyes remained nearly shut, and the crying seemed like that of a dreaming child.

She ceased crying immediately the operation was done, and was fast asleep in a moment. She was allowed to sleep for two

hours. Strong tea was then prepared, of which she was made to drink a cupful, and in another three quarters of an hour she sat up, dazed-looking but quite unterrified, and apparently oblivious of any pain.

The solution of chloral was too concentrated, and made deep wounds afterwards, which, however, healed up well enough.

We proposed to use the strychnia in case we might have given an overdose of chloral, as we have been in the habit, for a long time, of using it for chloroformed and narcotised animals, finding it always made them brisker. We have found, too, that a few drops in water generally overcome the nausea and vomiting which so often follow the administration of chloroform.

Reviews.

—o—

I.—A TREATISE ON CUTANEOUS MEDICINE AND DISEASES OF THE SKIN. *By* H. S. PURDON, M.D., *Physician to the Belfast General Hospital, Physician to the Hospital for Skin Diseases, &c. &c.* London: Baillière, Tindall & Cox. 1875.

WHILE the study of Cutaneous Diseases is yearly occupying more and more of the attention of the profession, and becoming more clearly recognised as an important and necessary branch of medical education, it follows as a natural consequence that new books devoted to the subject should be constantly making their appearance; and it is not surprising that a man who has given his attention for nine years to any department of medical science, should feel himself entitled to declare the result of his labours in print; Belfast, with its industrious population of 180,000, is well able to support a special hospital for skin diseases, to which Dr Purdon is physician; these perhaps are sufficient reasons for the appearance of the work now under notice; but for all this, we cannot, after perusal, avoid asking ourselves the question, what is the object of this book? It is notorious that many books are written (and this applies as much to the medical profession as to others) merely for the sake of making the authors' names known to the public, while many others are the sound fruit of, it may be, years of faithful work and diligent observation; which of these two very opposite

characters belongs to Dr Purdon's work we leave it to his readers to determine, but this much we may say for ourselves, that he tells us little about skin diseases that was not known before; and that, although a mass of interesting matter, chiefly of a theoretical nature, has been got together from various sources, we find but little evidence of new thought, and but few experiences of new modes of treatment proved to be useful, or the reverse, coming from the author himself.

In compiling a work on such a subject, quotations from other writers are by no means out of place; but we rather object to the extensive and promiscuous use which has been made of them in the present instance. In many cases they are quotations and nothing more, and owing to a certain vagueness and inconclusiveness in the author's style generally, and to an inconvenient habit of jumping rapidly from one subject to another, the reader is often left in ignorance of what Dr Purdon's own views really are. In the first chapter, for instance, more than a dozen different classifications of skin diseases are mentioned, more or less in detail, from Hippocrates to Wilson and Buchanan, but no conclusion is arrived at as to which the author prefers, nor any suggestions made as to how they might be improved.

With respect to the ætiology of Cutaneous affections, confessedly a difficult subject, many interesting theories are put forward, which are not altogether satisfactorily supported by argument. The observations of Cohnheim and Beale, Brown-Sequard, Virchow, and many others, have been made use of, and their views on general questions of physiology and pathology are quoted as explanatory of the particular conditions present in Eczema, Herpes, Urticaria, Pemphigus, &c. The favourite theory with our author seems to be that these diseases, and indeed nearly all cutaneous affections, are due to "vaso-motor spasm" and "vaso-motor nerve paresis." To a speculative mind such terms are doubtless very captivating, and Dr Purdon is by no means the only writer on the subject, at the present day, who is inclined to believe in the direct effect of the nerves upon the health of the skin. Mr Hutchinson, Tilbury Fox, and several American authors, are here quoted as advocating the same opinion. The acknowledged influence of the nervous system upon nutrition leads naturally to the idea that derangement in the quality or distribution of nerve force may be the cause of abnormal conditions in the various constituents of the skin; but with our limited knowledge of the precise action of the nerves upon absorption, secretion, circulation, and other processes involved in the term nutrition, it appears somewhat premature to accept "vaso-motor nerve paresis" and "nerve spasm" as suffi-

cient causes for the varied lesions to which the skin is liable. It may be true that the "paresis" and the "spasm" tend to cause inflammation, exudation, and suppuration, but one naturally asks further, to what then are the paresis and the spasms themselves due? Is it not some condition of the blood, as yet beyond our powers of demonstration, which has a paralyzing or irritating effect upon the nerves, deranging their healthy action, and so, through them, reacting upon itself or upon the tissues, whose health is dependent upon its integrity, or whose disease is the consequence of its derangement? We decline to answer the question here. It may be comforting, however, to Dr Purdon and his allies to remember that such theories as those we have referred to have certainly one advantage—namely, that if it is difficult or impossible to prove them right by any legitimate reasoning from facts, it is equally impossible to prove them wrong.

The study of the Parasitic affections of the skin is comparatively satisfactory, inasmuch as a certain and definite cause can be found by careful observation in each case. Dr Purdon adheres to the opinion already expressed by Tilbury Fox, that in the diseases known as Favus, *Tinea circinata*, *T. decalvans*, and *T. versicolor*, the same parasite is present in each case, and that the differences in the conditions and appearances found in these diseases are due merely to the fact that the vegetable growth is in a different stage of development. This may be true or it may not, but we submit that the bare statement of our author does not contrast very favourably with the evidence deduced, by a well-known dermatologist in this country, from microscopic investigation, and also from experiment, in support of the contrary opinion that there is an essential difference between the parasites found in *Tinea favosa*, *T. decalvans*, and *T. versicolor*. For the details of this evidence we must refer our readers to a work by Dr McCall Anderson, on "Parasitic Affections of the Skin."

The treatment of disease occupies a considerable portion of Dr Purdon's book; besides noticing many of the ordinary methods and formulæ in use, some others, not so common, are recommended as having yielded good results in his hands and as deserving of more extended trial. Such are the application of Iodoform in ointment for syphilitic and scrofulous affections; the use of chromic acid as a caustic in Lupus; and the use of linseed, with bran, as a basis for a nourishing hospital soup. Ozokerit is introduced to the reader as "a vegetable wax, so to speak, or if you like to apply a more sensational term, 'a burning earth;'" and

after describing how this substance has been made into candles by a London firm, the author tells us how it is used at the Belfast hospital as a remedy for Psoriasis, in place of the more expensive preparations of *Pix liquida* and Oil of Cade; against which he asserts that it holds its own. In the treatment of Psoriasis too, a remedy is recommended which has been more in vogue on the Continent than in Britain; viz., the internal administration of Balsam of Copaiba, given in large doses until extensive Urticaria is produced. By this means, it is said, that a more speedy and thorough cure has been effected, than by any other. This is so far satisfactory, and we should like to hear of further trials of the remedy; the explanation, however, of the manner in which Copaiba acts in such cases is hardly so clear as might be wished. After stating his conviction that the Urticaria induced by Copaiba kills the Psoriasis, because "two inflammations cannot exist together," Dr Purdon proceeds, p. 72:—

"Urticaria, both acute and chronic, seems to be a morbid condition, depending on a reflex sensation, often due to uterine or ovarian irritation. Balsam of Copaiba, then, by causing derangement of the stomach of a mere temporary character, inducing irritation that is conveyed to the solar plexus, the great centre of the sympathetic system presiding over organic life, and consequently, irritation by this means exerts, most probably, what I may call a reflex influence upon the nutrition of the skin. The nerves presiding over the part or parts attacked are awakened to a state of intense excitement, as may be proved by the formation of wheals, due to vaso-motor nerve spasm, in the first instance, and the influence exercised by such disturbance on the cutaneous nerves causes the normal processes of textural life to be improperly performed."

In conclusion, we have only to suggest that in preparing a second edition of his book, the author should exercise more careful supervision of the text: such glaring misprints as—"Statis of the blood;" "inflammatory;" "a buller;" "an alternative powder;" "a thrombous;" "the sympathetic nerve;" should not be permitted in the work of an educated man.

II.—A PRACTICAL TREATISE ON THE DISEASES OF THE EYE. By HAYNES WALTON, F.R.C.S., *Surgeon to St Mary's Hospital, Paddington, Surgeon in charge of the Ophthalmic Department of the same.* Third Edition. London: J. & A. Churchill. 1875.

THE third edition of Mr Haynes Walton's well-known work on the Surgical Diseases of the Eye, is not a simple reproduction of it as formerly issued; on the contrary, the additions and alterations are so numerous as almost to constitute it an entirely new work. In its new form, it is intended to be a complete treatise on Eye Diseases, and the increase in bulk which it has undergone is in the main due to the addition of chapters on subjects which did not fall properly within the scope of the author when he discoursed on surgical diseases alone; such are the chapters on the different forms of ophthalmia—the paralytic affections of the eye—anomalies of accommodation and refraction—geometrical optics, and on the ophthalmoscope and its applications. But, besides this, the chapters of the former volume have, in many instances, been re-written, while all have received numerous and important additions, the author endeavouring to incorporate therein the observations made by British and foreign ophthalmologists during the past fourteen years (since the publication of the second edition). The result is, the production of a work which, with all its demerits (and of these we intend to speak very freely), will take a high position as a work of reference, and will in some degree fill the place formerly occupied by Mackenzie's work, the English edition of which is now quite out of date.

The science of ophthalmology has of late years become so widened in its basis, chiefly as the result of the application of the principles of physics to the physiological and pathological optics of the eye, and the literature of the subject has so enormously increased, that few men can find time or opportunity to study it in all its aspects, or to work out all the problems which it presents. We are not, therefore, surprised to find that Mr Walton has sought the assistance of Mr A. T. Norton and Dr Clifford Allbutt to write upon those parts of the subject with which he feels himself least competent to deal, or which he has not had time fully to study; the want of unity which almost necessarily results from this arrangement can only be compensated for by the greater accuracy attained. The anatomical introduction, from the pen of the former of these gentlemen, is concise and intelligible; but we notice here and there the omission of details of some importance, such as the

existence, in the cornea propria, of the interlaminar spaces, which play so important a part in the nutritive and other interstitial changes. Whatever be the exact nature of these canals, their existence is indisputable, and the part they play in pathological processes a matter of much interest. Mr Norton cannot let slip so good an opportunity of advocating the congestion theory of accommodation, and the lithographic plates which he gives have evidently been drawn with a full remembrance of the exigencies of this view; we do not assert that the author has wilfully exaggerated the size of the ciliary processes, but cannot help noticing that these processes, neither in nature nor in the drawings of our best anatomical treatises, overlap the edge of the lens to the extent here represented. We may note, in passing, that in the recently published edition of Galezowski's admirable treatise, the author takes much the same view as Mr Norton, but, in the engravings illustrating the text, he shows that the ciliary processes, instead of overlapping the lens, do not even reach its margin.

Dr Allbutt's contribution to the work is unfortunate in being suited neither to the requirements of advanced ophthalmologists, nor of students or practitioners of medicine; for the former it is wanting in preciseness and accuracy of detail, and to the latter it will, we fear, be quite unintelligible. In a practical treatise such as this, we could well dispense with a disquisition on the theory of the ophthalmoscope; the knowledge of the use of the instrument, and some notion of the ophthalmoscopic conditions of the eye, being quite as much as persons in practice are likely ever to find necessary; while for others there are special works in French, German, and English which discuss the subject more fully than Dr Allbutt is here able to do. The question of the cause of the blackness of the pupil seems to disturb our author much. Giraud-Teulon, in the optical section of the French edition of Mackenzie, thus dismisses the subject:—"La pupille n'apparaît noire que parce que, dans la circonstance ordinaires, l'extérieur de l'œil est beaucoup plus éclairé que l'intérieur, et secondment, que si on l'éclaire avec une lumière artificielle même éclatante, on est toujours, par la nature même des choses, en dehors du chemin suivi par cette lumière à sa sortie." To say the same thing Dr Allbutt takes seven pages, and then leaves the reader as much in doubt as ever. Again, he unnecessarily confuses the discussion of this

question, as well as his subsequent dissertation on the theory of the ophthalmoscope, by giving undue importance to the path traversed by rays returning from an image formed on the retina; for, while we are completely at one with him as to their course, we think it a pity that he should omit to point out that, in practice, an image is not formed on the retina, the object being simply to illuminate the fundus of the eye, and this being best effected by the production of circles of diffusion. The description of the several forms of ophthalmoscope might with advantage have been condensed, and other forms than the half dozen here mentioned have come in for a share of attention; for instance, it seems curious that there should be no description of one of the numerous forms of "disc" or "refraction" ophthalmoscope which have within the last year become so fashionable.

Turning to Mr Walton's own work, we find him, as of yore, admirable in his description of surgical affections, very interesting in the clinical histories with which he furnishes us, and judicious if not brilliant in his treatment. Here and there we might suggest something more modern than our author supplies; but we are glad to meet with one who gives his own experience instead of a collection of opinions.

His treatment in the inflammatory diseases of the orbit is simplicity itself,—the application of cold or of heat,—the hypodermic injection of morphia,—the local abstraction of blood by means of leeches, or the artificial leech of Baron Heurteloup,—the use of chloroform and belladonna liniments, with rest, and a low but nutritious diet, forming almost his only remedial measures; he seems to have discarded calomel and opium, which, in the hands of our predecessors, gave such excellent results in these cases, and he is, on the other hand, decidedly opposed to the administration of alcohol.

In the matter of aneurism in connection with the orbit, he gives no uncertain sound, expressing his opinion in these words:—"According to the present state of knowledge, true or diffuse aneurism in the orbit, that is, aneurism of the ophthalmic artery, must be regarded as a very rare affection."* Indeed, it is almost unknown, if unequivocal evidence of its existence be demanded." This conclusion (which was expressed much less decidedly in the last edition of this work) is founded on the researches of Mr Nunnely and Mr Hulke, and on the cases published by M. Demarquay and Mr Z. Laurence; it results

* The italics are Mr Walton's.

in our author putting aside all consideration of aneurism, and discussing these cases under the head of "Vascular protusion of the Eyeball." Mr Walter Rivington, a few weeks ago, read a paper to the Medical and Chirurgical Society of London, in which he gave a very complete history of the literature of the subject, and the particulars of a case which he had himself recently treated to a successful issue by ligature of the common carotid. In his case there can be no doubt that there was a traumatic aneurism, not, however, of the ophthalmic, but probably of the internal carotid artery in the region of the foramen lacerum medium, and the occurrence of pulsating orbital tumours, with history of injury and symptoms of fracture of the base of the skull in other instances cited, would lead us to suspect a like pathological condition in them also.

The chapter on geometrical optics is simple and lucid, but does not go beyond the merest elements of the subject, such as are to be found in the school treatises on Natural Philosophy, and should be familiar to every medical student before passing his preliminary examination; to be of real value in the recognition and treatment of the optical defects of the eye this chapter would require to be extended so much as to render it out of place in a work of this kind, and we think it would therefore have been better had it been omitted.

The observations of Donders on the relation of strabismus to hypermetropia are subjected to searching criticism. Mr Walton, believing that this relation is by no means so intimate as the Utrecht observer infers, says:—

"In vain have I been looking for squint with hypermetropia only, that form of faulty refraction with good power of accommodation, in which the application of lenses will enable the squinter to see minute and distant bodies. I find, as a rule, that where hypermetropia is present with squint, loss of acuteness of vision is more frequently associated with it than not. I am, therefore, disposed to attribute the deformity more to the impairment of sight than to the hypermetropia. I suspect that hypermetropia is seldom absent when there is any other visual congenital defect."

He is further inclined to think that inflammatory affections of the conjunctiva and cornea, without the production of corneal opacity, are a more frequent cause of strabismus than is commonly recognised, as he found that in two hundred cases of strabismus fourteen were due to this cause. In such cases there is an extension of the inflammatory process to the muscles and their tendons, and a subsequent contraction of these. He does

not explain why it is commonly the internal rectus which is affected, and why all the muscles do not participate in the morbid process.

Chronic dacryocystitis, which in the last edition of this work was described under the improper title "*Obstruction of the Lacrymal Duct*," is here spoken of as "*Chronic inflammation of the Lacrymal Sac and Duct*," while obstruction of the canaliculi is discussed under a separate heading. This is, so far, an improvement, but the author still seems to be somewhat oblivious of the fact that the title *lacrymal duct* is appropriated to the passages which carry tears from the lacrymal gland to the surface of the conjunctiva; hence it is obviously a mistake to describe as "*Knife for the lacrymal duct*" an instrument which is intended for the purpose of opening the sac or slitting up the canaliculi. In the treatment of dacryocystitis, lacrymal fistula, &c., Mr Walton lays much stress on constitutional measures; very many of the patients being markedly strumous, it follows that any measures aimed at the local condition alone must inevitably be useless. As regards dilatation of the passages, he says:—

"My practice used to be to dilate for a short time only, using in the first instance a small, straight probe, and afterwards a larger one, and then to introduce a style. Now, I generally explore the duct, in the first instance, with my second-sized probe. If the channel be not very much narrowed, I insert a style. If it be so affected, but is evidently yet penetrable, I introduce a small silver wire, about the thickness of a hair pin, and long enough to be readily used, and allow it to remain, but cut off the upper part, and turn the end down over the eyelid, which is effected with two pairs of pliers, one to hold the wire, the other, with round points, to bend it in the form of a little hook. In a few days I remove this, and use a style."

He thus pursues much the same course as surgeons adopt in stricture of the urethra when they tie a catheter in the urethra, and leave it for some hours.

Much space is taken up by the discussion of anomalies of accommodation and refraction, but not more than the importance of the subject warrants. The relative frequency of myopia and hypermetropia is not here mentioned, but in another part of the work (namely, the chapter on strabismus, already referred to) the author says that hypermetropia is "even more common in some races of men than myopia." It is quite possible that one reason for hypermetropia being more frequent than myopia in the clinique of eye hospitals, is that the latter is more easily recognised and treated by opticians than the former; but

this will scarcely account for so large a difference as, for instance, that shown in the report of the Glasgow Eye Infirmary for the year 1874, where the cases of hypermetropia numbered 103, and those of myopia only 19. We think that the truth is that hypermetropia is everywhere the most common, but is not always recognised.

The interesting subject of astigmatism is treated in an intelligible and interesting, if not exhaustive manner—the observations of Donders in this, as in most other works, forming not merely the basis of the treatise, but greater part of the superstructure also. In the description of the ophthalmoscopic appearances in this affection, Mr Walton misses the chief diagnostic feature when he simply tells us that “The form of the optic disc appears to be altered from the normal type. It seems to be oval in the one direction or the other, according to the form of the astigmatism;” for it is no uncommon thing to find a like oval form in cases of atrophy of the nerve. In cases of astigmatism, however, we find, as Knapp has pointed out, that if the oval is vertical in the erect image it is horizontal in the inverted, and *vice versa*, thus distinguishing it from all other distortions of the disc, whether atrophic or congenital. Another method of diagnosis, which our author has omitted to mention, is the measurement of the corneal curvatures by means of Helmholtz’s ophthalmometer. This unfortunately requires an expensive and somewhat elaborate instrument, but it decides the point as to whether it is the cornea or the lens which is at fault, and from the data obtained a good mathematician may calculate the focal length of the glasses required. But in our experience the most simple and effective instrument for determining the amount and nature of the astigmatism is a simple optometer, having a 5-in. convex lens, a graduated scale, and a slide to hold the test object. For testing we use a card on which is drawn a circle, from the centre of which twelve lines radiate, and are continued some distance beyond the circumference. If the accommodation be paralysed, we can easily ascertain the point where the vertical line is distinctly seen, and then by moving the slide can find a similar point for the horizontal line. From these data we shall easily arrive at the nature and degree of the defect.

The varieties of ophthalmia here described are the catarrhal, purulent, morbillous, post-variolous, granular, erysipelatous, phlyctenular, diphtheritic, and cuticular conjunctivitis or xerophthalmia. It is satisfactory to notice so decided a reduction in the number of varieties usually described, many of which were very evidently only different

stages of the same affection; thus, Mr Walton makes no distinction between aphthous, phlyctenular, and pustular ophthalmia; he includes puro-mucous in his description of simple catarrhal, and *O. neonatorum* and *O. gonorrhoeica* under the heading *Purulent*. This is quite in accordance with our own observation, but we think the author should more distinctly have indicated the names which the affections have received from other writers; this would have been easily accomplished by means of a list of synonymous titles at the head of each section. Mr Walton follows Soelberg Wells in describing strumous ophthalmia as a form of corneitis, and there is no doubt that in nearly all strumous cases the cornea is affected earlier or later, but we contend that in by far the greater number the disease in its outset is simply a conjunctivitis, and that the cornea is only affected secondarily, just as it is in most instances of purulent, morbillous, post-variolous, and granular ophthalmia. The characteristic appearances and symptoms of the disease are the result of the constitutional state, the outcome of the strumous diathesis, and we know of no advantage likely to accrue from thus looking almost exclusively upon a local condition (phlyctenula), which is not invariably present; after all, we know of no name so well suited to the disease as the old one, "*strumous ophthalmia*." The treatment of this and the other forms of ophthalmia is in most instances strictly conventional, astringent applications being most popular with the author, especially alum, which he uses in the proportion of three grains to the ounce of water. He is not favourable to the use of nitrate of silver, even in purulent ophthalmia, and seems to have a decided antagonism to atropine, excepting where there is danger of perforation of the cornea. In that most troublesome affection, granular conjunctiva, Mr Walton reprobates the use of escharotics, such as sulphate of copper and nitrate of silver, placing his main reliance on the application of his favourite alum and tannic acid, or, if these fail, he blisters the eyelids. It is only in extremely chronic cases that he cauterises, and he then uses the pure liquor potassæ, which he applies only once, but so thoroughly as almost completely to destroy the granulating surface.

The general arrangement of the book is by no means good, and the index being far from perfect it is often very difficult to find what is required; thus, we have searched in vain for the description of that commonest of all affections, *ophthalmia tarsi*. We cannot think that it has been omitted,

but there is no mention of it in the index, and a long search has not revealed it to us in the text.

The instruments of all kinds are considerably behind the age, but the author disarms criticism in this respect by informing us that he only describes those which he himself has found most useful.

The style of writing is pleasant, and most of the chapters may be read without great mental strain; occasionally a vein of pleasantry peeps out, and here and there a little not ill-natured sarcasm. The author is always clear and definite in his statements, there is no such thing as being in doubt as to his particular views on any subject, and he always brings forward an array of facts to support any theory which he may advance. It is, however, seldom that he indulges in theory—the book is essentially practical.

Although the work is not so modern in its tone as we should wish, and although we take exception to many of the author's statements, we cannot but recognise it as the work of a practical ophthalmologist who has had a very large experience, and who has invariably drawn his own conclusions from cases under his own observation. It will take its place as a work of reference on the shelves of the general practitioner and the specialist alike.

III.—DISEASES OF THE KIDNEY AND URINARY DERANGEMENTS. *By W. HOWSHIP DICKINSON, M.D., Physician to and Lecturer on Pathology at St George's Hospital; Physician to the Hospital for Sick Children, &c., &c.* In three parts. Part I. Diabetes. London: Longmans, Green & Co. 1875.

THIS treatise on diabetes forms, it will be observed, the first part only of a more general work; the second part is to be a new edition of the author's work on albuminuria, and the third is to embrace other affections of the kidney, such as abscess, calculi, &c. Those who know Dr Dickinson's work on albuminuria will be glad to learn that a new edition of it may be expected this year, and they will likewise be prepared to believe that the present treatise on diabetes is marked by some originality, and by much clearness in arrangement and statement. The originality is almost exclusively limited to the pathological portion of the subject, and consists in the incorporation of the results recorded in his paper to the Medico-Chirurgical Society in 1870. The plates illustrative of that paper are here reproduced. Dr Dickinson contends that very

distinct lesions of the brain and spinal cord can be found with such constancy in diabetes as to justify us in regarding them as essential to the disease. Theoretical considerations from experiments on animals, and from the apparent causes of the disease in man (such as injury and disease of the brain, or mental anxiety and distress), predispose us to accept Dr Dickinson's view, although the subject must be followed up by more dissections, and by independent observers, before it can be received as a general doctrine. A further indication of the nervous origin of diabetes is supplied by the results of an investigation of the urine of 106 insane persons in Bethlem Hospital. Traces of sugar were found in nearly one half of the samples (47), and in 14 cases the amount of sugar was large enough to be recognised by the liquor potassæ test. The disease of the nervous centres is regarded as the original cause of diabetes, but the liver, of course, is acknowledged to be the channel through which the nervous disturbances produce glycosuria, and the kidneys as the organs on which the perverted action operates in producing diabetes insipidus. Apart from his researches on the morbid anatomy of diabetes, Dr Dickinson has not much that is new to bring forward. He gives a clear account of the doctrine of the production of sugar in the liver, and its appearance in the urine. His general account of the disease is good, and the principles of treatment laid down are sound. He believes that diet is the essential part of the treatment, and doubts whether patients might not do better on the whole if the physician limited himself to this, and refrained from drugs. He admits, however, the influence of opium and codeia, and extols the value, in a limited sphere of course, of strychnia, iron, and cod liver oil. He has a strong objection to the skim milk treatment recently advanced in this country, and has seen no benefit from the lactic acid treatment recommended from Italy. Lists of articles of diet—what to take and what to avoid—in severe and in mild cases, are supplied; and detailed notes of several typical cases afford not only illustrations of the disease, but exhibit likewise the influence of various remedies, experimentally tried, as shown by their effects on the quantity and the various ingredients of the urine. We have only to add that this "part" forms an essay on diabetes complete in itself, and that it is, very properly, furnished with a reference index of its own.

IV.—ST GEORGE'S HOSPITAL REPORTS. *Edited by* JOHN W. OGLE, M.D., F.R.C.P., *and* TIMOTHY HOLMES, F.R.C.S. Vol. VII., 1872-4. London: J. & A. Churchill. 1875.

It is, no doubt, highly desirable that the experience gained at our large hospitals should be recorded in such a form that it may be made available for the profession at large; but in what manner this may be best accomplished is a problem which the physicians, surgeons, superintendents, and registrars have hitherto only very partially solved. Elaborate tables, such as those which accompany the report of the Glasgow Royal Infirmary, are highly valuable and interesting to those who are well acquainted with the mode of classification adopted, and who are able to make allowance for fluctuations due to extraneous causes; but to the major part of the profession they are devoid of instruction, and would, at the best, be a very insecure foundation whereon to build a theory, or base a line of practice. Over these the Clinical Reports of individual surgeons and physicians of the cases treated by them exclusively have a manifest superiority, for in them we generally get some particulars as to the nature of the cases and the treatment adopted; but upon these the profession looks askance, regarding them as specimens of the "puff oblique," and it must be admitted that the evident tendency, in some of them, towards making the mortality each year less than the previous one, lays them open to severe criticism. The numbers, also, are too small to make the statistics of any real value. The original design of the reports of the several London hospitals seems to be an advance on both these methods, for it was intended that, along with the tabular returns, there should be exhaustive articles on the more interesting cases, and that sufficient particulars should be given to render the tables more interesting and instructive. Besides the information thus furnished, there were to be articles upon more strictly scientific subjects, contributed by present and former members of the staff, and alumni of the school. In process of time these latter articles came to preponderate over the former, and the statistical matter hence became cut down to the smallest dimensions, and relegated to the end of the book.

The present volume of reports contains many interesting articles, first among which we should place that by Mr Holmes on "Pulsating Tumours which are not Aneurismal, and on Aneurisms which are not Pulsating Tumours." The author is so well versed in all relating to aneurism that surgeons will gain confidence from his statement that the diagnosis is by no means so difficult as has been represented, and that, with proper precautions and a careful examination (especially with the

stethoscope), errors should be of most extreme rarity. To quote his own words—"I cannot admit that the diagnosis is so far obscure that a man can plunge a knife into an aneurism, and his patient bleed to death, without, at any rate, a very strong *prima-facie* presumption of gross and criminal negligence being raised against him."

Dr Ogle's contributions on "Some of the more unusual forms of Abdominal Disease," and "Two cases of Carcinoma within the Abdomen," are excellent specimens of elaborate clinical history, cautious theorising, and judicious practice. We recommend their perusal to physicians and surgeons alike.

Mr Brudenell Carter gives us one of his numerous extracts from his forthcoming book, and shows therein, pretty plainly, the symptoms of that *neuromania* which seems now to be epidemic. We must protest against the tendency to call everything, the origin of which is not quite evident, a *neurosis*. In this instance we do not notice that Mr Carter's theory affected his treatment or benefited his patients.

Dr Marcet's paper on "Consumption" is chiefly remarkable for very wild speculation and a persistent mis-spelling of the word "septicæmia." We trust that, before he writes again upon the subject, he will look up, in some Greek lexicon, the word for blood, and inform his readers his reasons for using the "œ" in preference to the "æ." It may be, however, that he is not entirely responsible, as we find the same error in another article, in the mis-spelling of the word "perinæum."

Dr Cheadle gives the history of seven cases of exophthalmic goitre, the interesting features of which were—that the patients were all women, that in all there was some disorder of menstruation, and that four were closely related, the latter feature suggesting an hereditary influence at work.

Mr Allan Mackay, under an inverted title—"Certain drugs, their value,"—discourses pleasantly on the remedies which he has found most efficacious in his own practice; but we object to the statement that Mr Power was the first to suggest the internal administration of belladonna in strumous ophthalmia, and especially that this treatment was not advocated prior to the appearance of that gentleman's paper in the *Practitioner*, October, 1873. If Mr Mackay will turn to the third edition of Wharton Jones's "Manual of Diseases of the Eye," which was published in 1865, he will find this treatment there spoken of, the mode of administration described, and the supposed rationale of its action discussed. We may further add, that both Mr Jones and the late Dr Mackenzie administered belladonna in these cases many years before the date last mentioned.

Our space will not permit that we should take up in detail the other articles which this volume contains; but, before closing, we wish to say a few words on the statistics of the surgical cases. The total number of surgical cases admitted was, in 1872, 2074; in 1873, 2048, the numbers being thus divided,—1872, males, 1224; females, 682; 1873, males, 1285; females, 760. We are not told the sex of the remaining 168 in 1872, and 3 in 1873; are we to suppose that they were epicene, or have the authorities of St George's adopted the classification of a certain American city, where the population is divided into males, females, boys, and girls? The mortality over all was, in 1872, 5·2 per cent.; in 1873, 4·8 per cent.; the small reduction in the latter year being the result of a smaller number of moribund cases admitted, and not of greater success in treatment. The cases of compound fracture numbered exactly the same in both years, and the mortality was also the same, namely, 33·3 per cent. The statistics of the amputations exemplify very well the danger of trusting too implicitly to the results deduced from small numbers, and show also the great differences which may be observed in consecutive years, without any apparent cause therefor. We will simply give the numbers, and let them speak for themselves;—

Name.	1872.			1873.		
	Number.	Died.	Mort. per cent.	Number.	Died.	Mort. per cent.
Primary,	9	4	44·1	4	3	75·0
Secondary,	1	1	100·0	...	...	...
For Disease, ..	17	7	41·4	13	2	15·3
Total,	27	12	44·4	17	5	29·1

The present volume of Reports will fairly maintain the credit of the Hospital and School whose name it bears, and the articles therein contained are most of them so thoroughly practical that even the most remote practitioner will peruse them with interest, and be able to profit by them.

V.—ON SPERMATORRHEA: ITS PATHOLOGY, RESULTS, AND COMPLICATIONS.
By J. L. MILTON, *Surgeon to St John's Hospital for Diseases of the Skin.*
Tenth Edition. London, 1875.

Is there such a disease as Spermatorrhœa? Medical opinion seems at present divided on this question. Some scout the idea, regarding what are detailed as symptoms of this disorder

as mere indications of virile vigour; others believing in the actuality of such as a disease, affecting some with great severity, and demanding for its alleviation the utmost care which the surgeon can bestow. This discrepancy may be accounted for partly by the habit prevalent among many of treating lightly or altogether disregarding the complaints of patients on this head. But it must be within the cognizance of most surgeons that there are a considerable number of patients labouring under a disorder the prominent feature of which is an apparent uncontrollable liability to excitement of the generative organs, with frequent seminal emissions. And if such be the case, it may be considered whether wilfully ignoring the disease savours more of quackery than the gross and vapid exaggerations of the charlatan.

In the present work, the author shows that this is a field for legitimate practice, and calls on the profession to study the matter for themselves. The pathology and treatment are fully entered into, and a very good digest is given of the various views at present current on the subject. On perusal it may nevertheless be felt that much is yet required to be done in the way of investigating the disease. With some few exceptions, the work is clearly and intelligibly written, and supplies a want.

VI.—1. RECHERCHES CLINIQUES ET EXPERIMENTALES, SUR L'ETAT DE LA PUPILLE PENDANT L'ANESTHESIE CHIRURGICALE PRODUITE PAR LE CHLOROFORME. Par P. BUDIN, Interne des hôpitaux et le DR P. COYNE, Ancien Interne des hôpitaux. Paris: 1875.

2. RECHERCHES SUR L'ETAT DE LA PUPILLE PENDANT L'ANESTHESIE CHLOROFORMIQUE, L'ASPHYXIE, ET SUR CERTAINS EFFETS DE L'APOMORPHINE. Par MM. BUDIN et COYNE. Paris: 1875.

THESE two pamphlets, which come before us at the same time, are by the same authors, upon the same subject, and are almost identical in their contents: contain the details of a series of observations and experiments, made with a view to determining if the state of the pupil affords any reliable indications as to the condition of a patient while under the influence of chloroform.

At the outset of their enquiry, the authors were struck by the wide difference of opinion which existed between different physiologists and surgeons as to the actual condition of the pupil in complete chloroform anæsthesia. For example, Jünken and Gubler say the pupil is dilated, and the latter draws therefrom the inference that anæsthetic is totally different from normal sleep, seeing that in this last the pupil is contracted. Perrin, on the other hand, gives, as the result of his investiga-

tions, that although during the period of excitement the pupil undergoes many changes, so soon as complete anæsthesia is obtained it becomes contracted, and remains so as long as insensibility is maintained. With M. Perrin our authors in the main agree; but they go further, and constitute it a rule that the operation should not be commenced until the pupil is thus fixed in contraction. In justification of this conclusion, they give details of twenty observations on the human subject, and ten experiments on animals, selected from about sixty of the former, and a great number of the latter, of which they have taken notes. These all show pretty conclusively that in the excitement stage of chloroform exhibition, the pupil is either in the mid-state between contraction and dilatation, or is widely dilated; as the insensibility grows deeper, it slowly contracts, but quickly dilates if the surface of the body be stimulated by electricity, the skin pinched, or the first cut of the operation made; at length complete surgical anæsthesia is obtained, when the pupil remains contracted, and the patient unconscious under all kinds of stimulation.

In all the cases noted, the chloroform was administered on a pad or handkerchief, and air was freely allowed to mingle with its vapour, so that the percentage of the anæsthetic in the inspired air was at no time large. The authors strongly reprehend the use of closed bags, or, indeed, of any apparatus, as they consider that the greater rapidity with which anæsthesia is by such means induced is more than counterbalanced by the increased risk of asphyxia.

Following upon the first notice of their observations, which appeared in *Le Progress Medical*, September 5th, 1874, M. Schiff, the celebrated Italian physiologist, made numerous experiments, chiefly on dogs, with chloroform, chloral, and ether, and arrived at conclusions regarding the first of these diametrically opposed to those of MM. Budin and Coyne. He found the pupil always notably dilated, and proposed to estimate the degree of anæsthesia by the degree of dilatation; the title of his paper being *La Pupilla come Esthesiometra*. This caused these gentlemen to make new and more extended observations and experiments, and more especially directed their attention to the state of the pupil in asphyxia. In this condition, they invariably found the pupil widely dilated, and as M. Schiff administered the agent in his cases "by means of a sac, with which he covered the muzzle of the dog," they reasonably, and we think correctly, infer that the dilated pupil in them was the result of asphyxia, and not of chloroform.

A further particular which came out in the course of these

investigations was, that whenever vomiting ensued the pupil immediately became dilated, and the patient less insensible, or even so far woke up as to render it necessary to stop the operation for a time.

The conclusions of the authors as regards the relationship between the pupil and the degree of anæsthesia are thus briefly summed up by them in the second of the two pamphlets under review:—

1. "If the anæsthesia is total, the pupil is contracted and immovable, and remains in that state, notwithstanding the application of the most powerful excitants to the surface of the body, or directly to the nerves.

2. If the anæsthesia is incomplete, we see the pupils dilate under the influence of the various excitants to which we submit the patient, who is then disturbed, and often groans or cries.

3. Finally, if vomiting supervenes, we see the pupil dilate under the influence of the efforts which characterise this phenomenon, at the same time sensibility returns more or less completely."

These conclusions are of much importance to surgeons and others who are constantly engaged in the administration of this rapid, effective, but somewhat unsafe anæsthetic; for it has long been observed by chloroformists that the test of conjunctival sensation is by no means to be depended on, cases not unfrequently occurring where, on the one hand, the sensation of that membrane is lost early in the course of the administration; or where, on the other hand, it persists, although the patient is perfectly insensible, and the incisions of the operation cause no movement. If, then, as MM. Budin and Cöyne assert, *complete* surgical anæsthesia is always distinguished by a fixed and contracted pupil, we shall in future have a valuable indication to guide us in the administration of chloroform, and shall be able readily to push the inhalation or suspend it in accordance therewith.

We would, however, point out that the pupil must not be trusted as an indicator of approaching danger, but that the respirations and pulse must be as carefully watched as heretofore.

In conclusion, we would suggest that all who are engaged in the administration of chloroform should put to the test the conclusions of the authors of these pamphlets, and should publish the results of their observations, with a view to a further elucidation of the subject.

VII.—CLINICAL LECTURES ON DISEASES PECULIAR TO WOMEN. *By* LOMIE ATTHILL, M.D. Third Edition. Dublin: Fannin & Co. 1875.

WE heartily welcomed the first and second editions of this excellent little treatise by Dr Atthill, and are pleased to observe that a third has now appeared, not differing from its predecessors in regard to general principles of treatment, but embodying results of a still wider experience. What strikes us as a peculiarly attractive feature of Dr Atthill's writings is the perfect candour they uniformly manifest. Failures in treatment are as simply recorded as successes, and the slight disappointment on this account at first felt by the reader, soon gives place to confidence and encouragement. His remarks, for example, regarding the danger attending the enucleation of uterine fibroids, and his unsatisfactory experiences of the subcutaneous injection of ergotine, render all the more trustworthy his advocacy of such remedies in uterine disease as the fuming nitric acid and the actual cautery. But without anew referring to the various contents of this interesting volume, we warmly commend it, as formerly, to the attention of the profession.

VIII.—CONSUMPTION AND TUBERCULOSIS: THEIR PROXIMATE CAUSE AND SPECIFIC TREATMENT BY THE HYPOPHOSPHITES UPON THE PRINCIPLES OF STECHIOLOGICAL MEDICINE. *By* JOHN F. CHURCHILL, M.D., *Paris*.

THIS work will hardly commend itself to the medical profession, and therefore we think it quite unnecessary to give it any detailed consideration. The fact that it deals in large measure with the wonderful virtues of certain secret remedies known only to Dr Churchill removes it quite out of the domain of scientific medicine, and the ill-natured abuse he heaps on all who differ from his opinions seems to indicate a consciousness of the weakness of his own case. He adopts as a motto a quotation from Laennec, commencing, "*Nostra aetas incuriosa suorum.*" It is well that it is so in certain cases.

IX.—CHOLERA: HOW TO PREVENT AND RESIST IT. *By* DR MAX VON PETTENKOFER. *Translated from the German by* THOMAS WHITESIDE HIME, A.B., M.B., &c. *Revised by* DR VON PETTENKOFER. London: Bailliere, Tindall & Cox. 1875.

THIS is a translation of a popular exposition of the leading points in Pettenkofer's views on cholera, which, however, Mr Hime feels sanguine will be found worthy of perusal even by medical

readers. We think his anticipations justifiable. The work cannot fail to interest all who profess to treat communicable disease.

According to Pettenkofer the occurrence and frequency of cholera depends essentially on three causes—(1) traffic, (2) local and temporal disposition, (3) individual disposition. If one of these be wanting, there can be no cholera. He is strictly a non-contagionist, and attributes the spreading of the disease to dirty clothes, especially if moist, also damp, watery, and slimy articles of food, &c., these being especially liable to take up the poison in dangerous quantity and infect a clean locality: not, however, because the clothes have belonged to a cholera patient, but because all have come from a cholera district: and if, in the invaded locality, the necessary local and temporal disposition co-exist, an epidemic results, and the place becomes a cholera district—otherwise the cases would be sporadic. In conformity with these views, Pettenkofer considers that choleraic excrements are not carriers of the poison, and that no reliance should be placed on their mere disinfection; attention should rather be directed to the localities which develop cholera. He lays great stress on the variations of the moisture of the soil in regard to cholera—that as typhoid shows a certain temporal dependence on this condition, so probably does cholera, but, being less frequent, the relationship cannot be so clearly proved. His “ground-water” theory may be put thus. Porous soils polluted with effete organic matter are the chief sites of cholera epidemics, and those ensue mostly when the ground-water is low, *i.e.*, when the soil is merely damp, as in summer and autumn, its interspaces being now filled with air. This stagnant air is soon charged with the products of decomposition now greatest; and should the germs of cholera have alighted on this soil, they are reproduced, and, being blown into inhabited houses in the vicinity, the inhabitants take the disease. Conversely when the ground-water is high the soil is filled with water instead of air, hence no polluted ground-air can enter adjoining houses. If, therefore, cholera is to be avoided, the soil, especially if porous, must be kept pure. All receptacles for effal should be watertight: cesspools, reservoirs, &c., in which organic matter or impure water might collect, should be abolished. Reference is also made in the book to individual disposition, surveillance of cases of diarrhœa, clothing, and attention to the skin, secret remedies, patent medicines, against the use of which, we are glad to see, an earnest warning is given; diet, drink. “Drunkards, especially brandy drinkers, are an easy prey to cholera.” We may remark that the late Dr Anderson, of Glasgow, was so

impressed with this fact that in cholera times he would have had every spirit shop placarded with the words, "Cholera sold here."

Pettenkofer does not (neither do we) believe in lady doctors. "Housewives can benefit the public health, both during and when there is no epidemic, by having everything regulated in the best manner in the household far more than even if a large number of them were to study and enter on the practice of medicine."

Disinfection, he holds, to be efficient, must fulfil two conditions—1st, the object to be disinfected must contain the poison; 2nd, the disinfectant must destroy the poison or render it inert. He holds that hitherto the advantages of disinfection have been problematical, and considers it the duty of the public health authorities to determine a rational plan by experimentation. He refers to the important fact that fresh, healthy urine and fæces are acid, and should be kept so by the addition of acid bodies, or, if become alkaline, their acidity restored. This is in perfect agreement with the opinions of Dr Dougall, so fully and frequently expressed in this *Journal*, as to principle, but not as to the agents he recommends for giving it practical effect. Pettenkofer prefers a mixture of sulphate of iron and carbolic acid—1st, because these do not develop any considerable quantity of gases from the decomposing excrements; 2nd, because they are cheap and easy to obtain. But, according to Dr Dougall, they do not fulfil the second condition of efficacious disinfection. In his experience, sulphate of iron is little more than a deodorizer, and that only in alkaline solutions. He is convinced that antiputrefactive and antizymotic powers depend on excessive acidity and alkalinity, especially the former, and therefore, as a rule, that free acids are preferable in disinfection to acid salts. As regards the use of carbolic acid as an antizymotic, Dr Dougall is of opinion that, at the most, it only renders the poisons temporarily inert, their energy returning so soon as the agent evaporates or is diluted otherwise. We are pleased to see that, for aerial disinfection, sulphurous acid gas is recommended, which, we agree with the author, "is one of the very best disinfectants" (antizymotics).

The views, so philosophically enunciated by Pettenkofer, as to the etiology and non-contagiousness of cholera, have recently been ably disputed by "a foeman worthy of his steel," Dr John Murray, Inspector-General of Hospitals, in the *British Medical Journal* of 1st March, 1873, to which we refer those desirous of examining the two extreme views in regard to the contagiousness or not of cholera. As is usual in such cases, however, it is probable the truth lies between.

The book concludes with an interesting appendix, giving the conclusions arrived at relative to cholera, by the International Sanitary Conference held in Vienna in July, 1874. We heartily recommend this little work; it is one of great interest, and will well repay perusal, not only by members of the medical profession, but by all who take a thoughtful interest in sanitary matters.

Exchange Journals.

By DR JOSEPH COATS, *Lecturer on Pathology in Glasgow University.*

REICHERT AND DU BOIS-REYMOND'S ARCHIV.

PART 3. 1874.

CONTENTS.—I. Investigations on the brain (new series), by Dr E. Hitzig, Berlin. II. Contraction of muscular fibre, by Karl Kaufmann (Plate XI. D.). III. On emulsions: their formation, and their value in the absorption of neutral fats in the intestine, by Dr J. Steiner, Halle. IV. Anatomy of *Pyrrhocoris apterus* L., by P. Mayer, Greifswald (Plates VII., VIII., and IX.). V. A contribution to our knowledge of nutrition, especially of respiration in insects, by O. Bütschli. VI. Some remarks on chitin, by O. Bütschli.

I. Presence of Fluid in the Sac of the Dura mater (Hitzig).—This is rather an important communication regarding the exact situation of the extra-ventricular fluid within the skull. It is the almost universal experience of pathologists that after death the dura mater is applied to the surface of the brain: or, in other words, that the parietal layer of the arachnoid is applied to the visceral. When fluid exists outside the ventricles, it is not met with in the cavity of the arachnoid, but in the meshes of the pia mater, or the subarachnoid spaces. Hence there have arisen serious doubts whether this sac of the dura mater or arachnoid, using these terms as equivalent, is properly a serous sac. The present author, in his numerous vivisections of dogs, has convinced himself of the existence of fluid in the sac of the dura mater in the living animal. He has observed a hundred times that when the skull is trepanned, and a cut made in the dura mater, fluid wells out

in no insignificant quantity. He found, however, that if the head of a dog is examined 24 hours after death there is no fluid in the sac; but if a wedge-shaped piece of brain substance is cut out, the apex opening the ventricle, the cavity becomes filled with fluid. The question is, What has become of the fluid which during life existed in the sac? He believes it to be absorbed by the brain substance, and that its absorption is due, not to any hygroscopic character of the brain substance, but to the existence of an elastic pressure of the brain. During life the pressure of the secretion of the fluid counterbalances the elastic pressure of the brain, but after death the former disappears, and the latter, acting alone, causes absorption of the fluid. There are several facts confirmatory of the existence of this elastic pressure of the brain. If the skull of an animal be opened soon after death, fluid still exists in the sac, and exists at a certain pressure, welling out when the dura mater is opened. This pressure cannot be due to the pressure of the circulation, which has ceased, but must depend on brain pressure. Then, even after the entire absorption of the fluid, a cut made through the soft membranes causes the brain substance to project, showing a certain pressure. It has also been mentioned that, on removal of a wedge-shaped portion of brain substance, the cavity is filled with fluid, which shows, at least, that the brain is not hygroscopic, and is presumptive of pressure. By opening the skull of dogs at various periods after death, it was seen that the absorption of fluid was gradual. From these observations the author deduces some hints as to the interpretation of certain facts by pathologists. It is evident that if fluid always exists in the sac of the dura mater during life, and is absorbed after death, the superficial layers of the brain substance must always be found in a state of maceration. From the existence of the elastic pressure it seems obvious that acute exudations will disappear much more rapidly after death than chronic ones—the long existence of the latter probably reducing the elastic pressure. These remarks apply to exudations both on the surface of and beneath the arachnoid. It is very possible that many an acute hydrocephalus externus is set down at *post-mortem* examination as an oedema of the brain. It also appears from these remarks that when we find fluid in the pia mater, either the brain has lost its elasticity, or it has diminished in volume, so that in either case it no longer presses the fluid into its own substance. The author calls the attention of alienists to this subject, as well as to the

fact, reported by some, of the rare existence after death of fluid in the sac of the dura mater itself.

III. The Emulsion of Fats in the Intestine (Steiner).—The question put here is. By what mechanical force are the fats emulsified in the intestine? It is well known that bile, pancreatic juice, and intestinal fluid act as emulsifying fluids, but the whole that such fluids do is to keep the finely-divided particles of oil separate, a force is needed to divide the oil. The apothecary uses a solution of gum arabic as his emulsifying fluid, and the oil is divided by means of the mortar and pestle. The author comes to the conclusion that the peristaltic action of the intestine is sufficient to emulsify the fats, bile being the chief fluid used. He has compared the emulsifying power of bile with that of other fluids. He finds that in a given time oils triturated with bile are more finely divided, but that the emulsion is less permanent than when solution of gum arabic is used. For the purposes of absorption in the intestines, however, bile has in both these respects a decided advantage over gum arabic. Less force is needed to divide the oil, and the permanence of the emulsion represents a certain amount of tension, which would require extra force to overcome. The author found that a slight force, not certainly greater than that of peristaltic action, was sufficient, with bile, to emulsify fats, although, of course, slowly. On killing dogs at various periods after eating, it appears that up to a certain point the filling of the chyle vessels increases with the duration of digestion, and that, as time goes on, the quality of the emulsion improves. In fact the intestine takes time to make up for the weakness of its mechanical force, and the filling of the chyle vessels is proportional to the quality of the emulsion. The emulsification of the fats is thus necessary for their absorption.

PART 4. 1874.

CONTENTS.—VII. On the influence of the nervous system on the state of the vessels, by Dr F. Putzeys, Lüttich, and Dr J. Fürst Tarchanoff, St Petersburg. VIII. Investigations on the brain (new series), by Dr E. Hitzig, Berlin. XI. A new modification of Rivet's microtome, by Professor G. Fritsch, Berlin (Plate X.). X. On larynxes, with supernumerary arythyroid articulations, by Dr W. Gruber, St Petersburg (Plate XI. A.). XI. On larynxes, with a supernumerary median process, &c., by the same (Plate XI. B.).

XII. On the musculus plantaris bicaudatus, with termination of its supernumerary head in the ligamentum popliteum, by the same (Plate XI. C.). XIII. The innervation of the frog's heart, by Dr Steiner, Halle. XIV. Anatomical and Physiological investigations on the sensory nerves of muscles, by C. Sachs (continuation) (Plates XII., XIII., and XIV.). XV. On the varying power of resistance of bones in the dead and living state, by Dr C. Aebly, Bern.

VII. **Relation of Peripheral Centres to the Tonicity of the Blood Vessels** (*Putzeys and Tarchanoff*).—This paper is of interest both as correcting certain views which seem to be erroneous, or at least lacking foundation, and also as rendering more certain the inferences in certain other directions. It was proved by Claude Bernard that division of the sympathetic in the neck causes dilatation of the blood vessels of the ear and head generally, and this was accounted for on the theory that the vaso-motor nerves were paralysed by being divided from the centres. But, since the time of Bernard's observations, it has been discovered that two nerves at least, the chorda tympani and the nervi erigentes, are capable of producing, by their irritation, dilatation of the vessels. The facts connected with these nerves lead to the inference that there are certain peripheral centres connected with the blood vessels whose action keeps the vessels in a state of contraction. The irritation of the nerves mentioned reduces or inhibits this action, and allows dilatation of the vessels. These discoveries have raised the question whether the dilatation of the vessels, after cutting the sympathetic or other nerve, may not be due rather to an irritation of these nerves producing an inhibitory action on peripheral ganglia, than to a paralysis of the nerves. Goltz has investigated this, judging of the state of the vessels by the temperature of the part. He concludes that there is a peripheral mechanism whose duty it is to keep up the tonicity of the vessels, and to regulate, within certain limits, the circulation; and that there are, in the sciatic nerve, fibres whose irritation causes dilatation of the vessels, and these fibres may be set in action by simple section, or chemical, or electric irritation. The present set of experiments seriously alters these views in some particulars, though confirming them in others. There is no doubt that after cutting the sciatic nerve the vessels of the leg are dilated. In the frog, where the nerve was divided on one side, and the toes of both feet ampu-

tated, the bleeding was so free on the injured side as to cause anæmia. But, contrary to the statements of Goltz, irritation of the cut end of the nerve causes contraction of the vessels which, in higher animals, soon gives way to dilatation, evidently from exhaustion of the nerve. It is this dilatation following on the contraction that has misled Goltz. In frogs the authors were not able to cause cessation of the bleeding by irritating the nerve; and in warm-blooded animals, in which the temperature of the limb had been increased by cutting the nerve, it was impossible to bring back the temperature to the wound by irritating the nerve, for before this point was reached the dilatation had occurred. The dilatation is therefore still paralytic. But now, when the sciatic has been cut and dilatation has ensued, the vessels, after a few days, recover, return to their normal size or become even narrower. This can only be accounted for on the supposition of peripheral nervous centres, which are, normally, very much under the command of the higher centres through the sciatic; but when divided from these centres, bestir themselves and more actively command the vessels. The dilatation itself may, by supplying a greater abundance of nourishment, increase the activity of the centres. We know, also, that when the cord is divided from the brain, its independent action is more vigorous than before, and so may it be with these peripheral centres when separated from the higher ones. The existence of these centres is still further confirmed by the rhythmic contraction of the arteries which has been so often described. This persists in the frog's web after division of the sciatic.

VIII. Investigations on the Brain (*Hitzig*).—These observations will have great interest to the special student of this department of physiology. The author has devoted much pains to the investigation of the centres on the surface of the cerebrum; and his famous experiments, in which the existence of motor centres in the convolutions, which could be stimulated by electricity, was first demonstrated, are well known. In the present series he takes up the question from the other side. He trepanns the skull, and removes portions of the hemispheres. He finds that on removal of small portions of convolutions in regions where irritation did not produce movements, there is no interference with motion. He considers that while there are, in the hemispheres, groups of organs directly related to the movements of the body, there are others not so related. He

comments on the fact that in observations on man there has been so little correspondence observed between symptoms and seat of lesion, and accounts for it by the complicated nature of the facts. When these are disentangled, we shall attain in cerebral pathology to the precision of cerebral physiology.

XIII. The Ganglia of the Frog's Heart (*Steiner*).—

Certain substances, when applied to the excised frog's heart, diminish its pulsations. Among these are bile, strychnine, and chloroform. In the heart there are two ganglionic systems—that situated in the sinus, and that in the atrio-ventricular groove. The former is the automatic centre, and originates the normal rhythmic action of the heart. The other is set in action, under normal conditions, by the sinus-centre, but may be set in action by an external agent acting directly on the heart, even when the sinus has been removed. The substances named act on the sinus-centre alone, and when, by their means, it has ceased to cause the rhythmic contractions, these cannot be again set going by irritating that ganglion, but the ganglion may spontaneously recover, and by and by resume its action.

PARTS 5 AND 6. 1874.

CONTENTS.—XVI. First contribution to the analysis of the waves of contraction of the striated muscular fibre, by A. E. Jendrassik, Budapest. XVII. Comparative observations on the ossa interparietalia of man, by R. Hensel. XVIII. On a human larynx with a lateral ventricle situated partially outside the larynx, by Dr W. Gruber (Plate XV.). XIX. The vaso-motor nerves of the arm, by H. Frey (Plate XVI.). XX. Remarks on the article XII., Bd. III. II. 2, of the *Archiv für experimentelle Pathologie*, by Dr E. Hitzig. XXI. Physiological and anatomical investigations on the sensory nerves of muscle, by Carl Sachs (Conclusion) (Plates XVII. and XVIII.). XXII. A contribution on the preservation of anatomical preparations, by Dr C. Seemann, St Petersburg. XXIII. On the immunity of the torpedo to its own shock, by Dr J. Steiner, Halle. XXIV. Anatomical remarks on the position and variations of position of the uterus, by Ad. Pansch, Kiel (Plate XIX.). XXV. The chemical conversion of starch into sugar, of sugar into alcohol, and of alcohol into acetic acid or to carbonic acid, in the presence of fungoid organisms, by J.

P. Dahlen, Treves. XXVI. Contributions to physiology, by Dr Dönhoff. XXVII. Correction to the historical investigations on the gl. utriculares, by Dr Haussmann.

XXI. The Sensory Nerves of Muscle (*Sachs*).—This is the concluding part of an essay which received the prize from the medical faculty of the University of Berlin. The two other parts of the paper are in Parts 2 and 4, and the whole forms an interesting and important monograph. The knowledge we have of the actions which our muscles go through, in obedience to the will, seems to depend on several circumstances. According to Helmholtz, these are chiefly three—(1) the known intensity of the effort of will by which we seek to produce a certain movement, (2) the tension of the muscles or the force with which they endeavour to act, and (3) the result of the effort, evidenced by the state of contraction of the muscle, the altered position of the limbs, and tension of different parts of the skin. The first and second of these involves the belief in the existence of special centripetal nerve fibres in the muscles, and the existence of such being disputed, the author endeavours to decide the question by anatomical and physiological investigations. In the first place, he endeavours to prove that a reflex action can be set up by irritating a muscle or its nerve, which has been separated from connection with the rest of the body. In the frog the sartorius muscle was separated from everything except its nerve, and then placed on a glass slide. The animal having been made more susceptible to reflex action by strychnia or picrotoxin, it was found that irritation of the isolated muscle or its nerve produced reflex contractions of the leg of the opposite side. And the experiment was varied so as to preclude the possibility of the irritation affecting any part except the isolated muscle, but with the same result. In another series of observations, the author divided the anterior or motor roots of the sciatic nerve of the frog. It is known that, when a nerve is cut, the portions removed from their centre of nutrition degenerate, and, in the present case, the degeneration affects all the motor branches to their finest ramifications. The muscles, when examined, show plainly enough these degenerated ramifications, but along with them there are a few isolated fibres which remain unaltered, and are, therefore, nerves whose roots have not been cut, and presumably sensory. Section of the posterior roots produced degeneration of these few fibres, but the appearances are not so

prominent, the sensory fibres being exceedingly few. Again, in the living animal, it was possible, with the aid of the microscope, to irritate isolated nerve twigs in the sartorius. When this was done, it was found that there were some twigs whose irritation produced contraction, and some in which there was no contraction of the muscular fibres. The latter were not motor but sensory. It was even possible to irritate the entire nerve of the muscle, and, by cuts made, to isolate portions of the muscle so that they did not contract. Yet, microscopic examination showed that there were still nerves in these parts which retained their connection with the centres, and which must be sensory. As to the anatomical distribution of the sensory nerves of muscle, the author concludes, from an extensive series of observations, that they consist of comparatively few medullated fibres which divide, and so form secondary and tertiary ramifications. These are distinguished from the motor branches by the ramificatory mode of distribution, spreading out and forming anastomoses, while the motor are distributed in bundles, and increase by division. The essay is illustrated by a number of drawings.

XXII. Preservation of Anatomical Preparations (*Seemann*).—The author lays claim for his method that it preserves anatomical preparations for an indefinite period, and in a condition exactly like that in which they were on removal from the body. The method is fully described in pp. 681-2.

STRICKER'S JAHRBÜCHER.

PARTS 3 AND 4. 1874.

CONTENTS.—I. Reform of the arrangements for teaching the diseases of children in the German Universities, by Dr J. Eisenschitz. II. Contribution to our knowledge of the action of antiarin on the organs of circulation, by Dr C. von Schroff, jun. III. On primary tumours of the dura mater, by G. Bizzozero and C. Bozzolo (3 Plates). IV. On the influence of chloral hydrate on the irritability of the nervous system, by Dr Prokop Rokitsansky. V. The histology of the connective tissue, by Dr Loewe (1 Plate and 5 Woodcuts). VI. A contribution on inflammatory changes of the brain, by Dr A. Ceccherelli. VII. On the behaviour of neurin towards albuminous bodies, by J. Mauthner. VIII. On the formation of callus, by Dr J. Hofmökler (2 Plates). IX. On the existence of adenoid substance in the mucous membrane of the human larynx, by Dr M. Heitler.

X. Investigations on the process of suppuration, by S. Stricker (1 Plate and 4 Woodcuts). XI. The anatomy of the human skull, by Dr C. Zuckerkandl. XII. The thermometry of the uterus and its diagnostic significance, by Dr W. Schlesinger. XIII. Observations on the first phase of development of the *pelobates fuscus*, by Dr M. G. Moquin-Tandon (2 Woodcuts). XIV. Contribution on the first formation of the allantois, by Dr M. Olivetti (1 Plate).

II. Effects of Antiarin on the Circulation (*Schroff*).

—Antiarin is obtained from the arrow-poison of Java, which is a product of the *Upas antiar*, and authors are generally agreed that it acts on the heart directly, either on its muscles or ganglia, and not through the central nervous system. The present author generally confirms this view; and on the basis of numerous experiments concludes that it diminishes the irritability of the peripheral terminations of the vagus; that it heightens the tone of the muscular fibre cells of the blood vessels or of the vaso-motor centres—the increase of intra-vascular pressure, which is the evidence of this, being more marked in dogs than rabbits;—and that it directly paralyses the heart.

III. Tumours of the Dura Mater (*Bizzozero and Bozzolo*).—

These authors have examined 28 primary tumours of the dura mater, and intend to publish a detailed account of their structure. Meanwhile they communicate the general results, and point out the classification which they have come to. All the tumours were of the connective tissue type, some more, some less cellular. But the connective tissue presented characters which are sufficiently distinctive to warrant the separation of these tumours from those of other parts. There were fibres very like those of tendons for the most part, but generally more homogeneous; but the cells were very different. They commonly consisted of flat plates, like endothelial cells; and groups of them often existed in the form of globes, the endothelioid cells being placed in layers outside one or two round or polygonal cells. These cells, from their resemblance to endothelium, are called endothelioid, and the globes endothelioid globes. These latter often resemble epithelial globes met with in epithelioma, but the difference in nature is manifested in the fact that often some intercellular substance could be detected between the flat cells of the globes. The connective tissue and endothelioid globes are prone to undergo two changes—sclerosis or condensation and calcification. The latter is always preceded by the former, but sclerosis may occur

without calcification following. The authors distinguish three forms of growths, which they name respectively alveolar endothelioid sarcoma, fasciculated endothelioid sarcoma, and endothelioid fibroma. These tumours are analogous to the ordinary connective-tissue tumours of like name, but distinguished by the presence of these endothelioid cells.

IV. Action of Chloral Hydrate (*Rokitansky*).—There are three effects of chloral hydrate asserted in this paper. It is a direct heart-poison, but only so when concentrated. A solution injected into the heart stops its pulsations by paralyzing the ganglionic centres, but when introduced into the circulation at a distance, so that it reaches the heart after passing the capillaries, its effect is very much less. In the second place, if chloral is introduced into the circulation, its effect on the respiration is very much like the effect of separating the medulla oblongata from the pons. In a former paper the author pointed out that this reduces the irritability of the respiratory centres (see this *Journal*, July, 1874, p. 412.) Just as in that case, so after the administration of chloral the respiration gets slower and slower till it stops, the heart still beating. If artificial respiration be now used, the animal again begins to breathe of itself; but if this is left off, again the respiration gets slower till it stops, and the animal dies without convulsions. The motor centres for the voluntary muscles are also reduced in irritability; stimulation of the sciatic nerve does not produce any reflex movements. But in the third place, chloral hydrate reduces the irritability of the vaso-motor centres. If the brain be exposed and the surface directly irritated, while the intravascular pressure is recorded, it is seen that irritation under ordinary circumstances raises the pressure. But after chloral hydrate has been given it does not do so. Likewise, interruption of respiration raises the blood-pressure (irritation of dyspnoëic blood), but with chloral hydrate it has not this effect. The vaso-motor centres are hence reduced in irritability.

V. Structure of Connective Tissue (*Loew*).—This paper illustrates the structure of connective tissue chiefly in the case of the tendon and its surrounding loose tissue, but also in muscle and nerve. The tendon he compares to muscle. We have fine cylinders, which are united in groups of 30-50, each group having a proper sheath like the sarcolemma of muscle, and called here the tendilemma. This tendilemma is properly a serous membrane, and outside it there is a lymph space, and outside that again a membranous

sheath. The membranous sheaths of the various bundles of course come in contact at various points, and are united more or less closely, there being sometimes spaces between them in which are fibrillæ, and in which run the blood vessels. The loose connective tissue which separates the firm fibres of the tendon is, therefore, not a disorderly collection, but a system of membranous sheaths surrounding lymph spaces, in which the fibres of the tendon move freely. Similar arrangements obtain in muscles, nerves, and glands, where we have a sarcolemma, neurilemma, glandilemma. In these, also, there are lymph spaces outside the covering of the proper structure, and these spaces are confined by membranous sheaths and so on. These are all serous membranes, and show endothelial cells lining them.

X. The Process of Suppuration (*Stricker*).—Here we have the question of inflammation and suppuration again discussed, and the cornea is still the chief, though not the only, battle-field. It is well known that, for the purpose of studying the changes in the cornea, the method of staining with chloride of gold has been extensively used. The author has used this method, but, in the present case, he has preferred staining with silver. He applies the silver in the living animal, either solid or in solution, and he generally narcotizes the animal (oftenest the cat) with chloroform or ether. Gold colours the cornea corpuscles, leaving the basis substance comparatively clear. Silver gives a brown colour to the basis substance, leaving the cornea corpuscles, with their processes, as a fine clear protoplasm network. The effects of inflammation are thus described by the author:—"In the normal cornea (stained with silver) we find a clear mesh-work mapped out by the silver on a dark ground. In the inflamed cornea, on the other hand, we find areas, at the circumference of which the appearance is still normal or nearly normal; then, passing inwards, the trabeculæ of this mesh-work become granular, and divided by brown lines into segments, which are at first large; the trabeculæ then enlarge, and the brown basis substance proportionally diminishes; the division advances, and the segments get smaller; finally, the basis substance disappears altogether, and a collection of cells is developed in place of the cornea tissue." It is pointed out that, in normal division of cells in the embryo, the cells at first remain sticking together, and only separate afterwards. So is it in inflammation, they only separate after a time, then the tissue is destroyed, and

pus containing free inflammatory cells is formed. He also records that, in cases of inflammation of the ear of the rabbit, the tissues were swelled and infiltrated with serum. When an incision was made, and the serum was pressed out, there were only red blood corpuscles and a few white—no proper pus. But when the tissue was examined microscopically, there were collections of cells presenting all the characters of suppuration in full process of development. But, as was proved by the constitution of the serum, these cells were still adhering. If they had been migrated blood corpuscles, the serum should have been pus. It is also pointed out, with some cogency, that at the outset of inflammation there is no proper suppuration, there is only a serous discharge for some days. Yet the migration of white blood corpuscles hitherto observed has been an early phenomenon. He considers it by no means proved that this migration is an essential phenomenon of inflammation. It will thus be seen that this author is still as far as ever from agreeing with Cohnheim, and that he goes in for the origin of inflammatory cells in the tissues themselves. He winds up his article with a series of quotations from Cohnheim, in which that author, in earlier publications, denies, and, in later, asserts the existence of a central inflammation of the cornea. In the paper there is also a paragraph containing general observations on the structure of the cornea.

VIRCHOW'S ARCHIV.

VOL. LXII., PART II. DECEMBER, 1874.

CONTENTS.—VIII. A case of primary endocarditis diphtheritica, by Prof. R. Maier, Freiburg. IX. On the relation of the blood and lymphatic vessels to the serous canals, by Prof. J. Arnold, Heidelberg (Plate II.). X. Changes in the liver in consequence of artificial obstruction of the portal vein, by Dr A. Solowieff, St Petersburg. XI. Experimental investigations on the functions of the brain, by Prof. H. Nothnagel, Jena. XII. On the tensor tympani muscle, and the division of its tendon as a therapeutic means, by Dr Weber-Liel, Berlin. XIII. On the hygienic significance of the amount of moisture in the atmosphere, by Dr F. Falk, Berlin. XIV. Smaller communications: (1) Supplemental correction to the paper on the normal and pathological growth of long bones (Archiv Vol. LXI.), by Dr Georgo Wegner. (2) Contributions to the anatomy of the fistula colli congenita, by Dr H. Rehn. (3) What shall we eat? by M. Kornfeldt. (4) Artificially induced

abortion in Japan, appendix to article in Vol. XXXIII. of this Archiv, by Dr W. Stricker, Frankfort.

VIII. Diphtheritic Endocarditis (Maier).—This is a case which clinically had many of the features of septicæmia. After death one of the folds of the aortic valve was ulcerated, perforating into the left auricle. On the surface of the ulcer there was a soft substance, which, in addition to the pus-corpuscles, contained a punctiform granular material, which, from its resistance to reagents and other characters, the author takes to be composed of low organisms. There was also lobular pneumonia and embolic affection of the kidneys. In the blood vessels of the kidneys, and especially the Malpighian tufts, there were again these granular masses. In this case there were evidences of old endocarditis, and the organisms seem to have seized first on the altered valvular structures. The mode of their entrance into the blood it is difficult to make out; there was no external wound.

IX. Relation of the Serous Canals to the Vessels (Arnold).—In a former paper (see this *Journal*, Jan., 1874, p. 133) the author has shown that under certain circumstances the red blood corpuscles pass through the vessel wall, their points of egress being the widened apertures, which he calls stigmata. In the present paper he discusses still further the relation of the blood and lymphatic vessels to the spaces which have been variously named lymph canalicular spaces, serous canals or channels, &c. His present results are based on injections. But before injecting he generally uses some method by which the stigmata of the vessels shall be widened. In his first set of experiments, he ligatures the lateral veins of the frog's tongue, so as to produce œdema, and then he injects the blood vessels from the aortic bulb. He finds that the fine injection passes out of the vessels by the stigmata, and into a network of ramifying spaces. In another series he investigates the canalicular system of the frog's web. After having ligatured the veins of the leg, or the entire leg, he injects either the blood vessels or the lymphatics, or both. It may be stated, as the result of these injections, that there is a regular network of spaces lying between the blood vessels and the lymphatics, but not in very open communication with either. This system is not simply the indefinite spaces left indiscriminately in the tissues, but a regular network. The lymphatic vessels possess two kinds of openings, one which he calls stomata, and which have been often described. By these the

lymphatic vessels communicate with each other or with lymph spaces. But there are other smaller apertures, which he calls stigmata, and which normally are either open, or closed by a soft material. It is by these that the lymphatics communicate with the serous channels, and they are strictly comparable with the stigmata of the blood vessels. The lymphatic and blood vessels, therefore, form each a system of closed tubes, between which lies the canalicular system, which belongs to neither, but communicates with both through the stigmata in the respective systems.

XI. Function of the Thalami Optici (*Nothnagel*).—The method of experimentation generally used by this author has been the destruction of a minute portion of the brain by injecting a drop of solution of chromic acid. He has not succeeded with this method in the case of the optic thalami, and has devised a small instrument, which is introduced as a needle, but whose extremity can be made to open up after its insertion, so as to destroy a portion of the structure; it can then be closed and withdrawn. By this means he succeeded in destroying the thalami optici. After the destruction of these on both sides there was at first no obvious change. The animal could run about much as usual. But on more careful observation there was found to be a change similar to that described in his first article as produced by destruction of a certain definite spot on the surface of the cerebrum (see this *Journal*, Aug., 1873, p. 547). The animal seems to have lost the “muscular sense,” has no proper appreciation of the position of its limbs, and when they are slowly moved into peculiar positions it does not endeavour to recover them. When both thalami optici are destroyed, at the same time with both nuclei lenticulares, the phenomena are like those when only the latter are destroyed. The animal sits quiet, but, when the tail is pinched, gives a sudden mechanical spring. Destruction of one thalamus opticus causes defective appreciation of the position of the limbs on one side. There follows on the detail of the experiments an analysis of them. The thalami optici have been generally considered motor ganglia. Fourné and Ferrier have recently asserted that they are sensory. The author doubts their conclusions and is of opinion, from his own observations, that, while the lines for voluntary motion do not pass through them, the fibres conducting impressions of touch are also unrepresented here, or only to a slight extent. The author endeavours to explain the loss of the “muscular sense,” and to bring his

results into harmony with the theory which Meynert has devised on the basis of anatomical research. This author asserts, on anatomical grounds, that the thalami and corpora quadrigemina have nothing to do with the conduction of motor impulses. They have three lines of communication, one with the sensory surfaces, one with the muscles, and one with the cortical substance of the brain. Meynert supposes that the thalamus determines the higher combined movements which are produced reflexly and involuntarily. Impressions conveyed by the fibres from the sensory surfaces give rise to answering movements of the muscles. But, at the same time, an impression of this process is conveyed to the cortex of the cerebrum, and there fixed or registered in the ganglion cells as an impression of memory. These impressions of memory form the basis of future voluntary and conscious movements of the same kind, in a manner which the present author does not go into. Now, it is well known that the retention of the proper position of the limbs in an animal is not a voluntary although a complicated movement; it is a highly-developed reflex or answering movement, and, according to Meynert, would have its seat in the thalami. It is this which is lost when these ganglia are destroyed. The animal loses the appreciation of the proper position of its limbs, although, the basis of voluntary movements having been already stored up in the cerebrum during the animal's previous life, it retains the power of voluntary movement. If Meynert's ideas are correct, then destruction of the thalami in a newly-born animal should prevent the development of voluntary movements. The author has endeavoured, but has not succeeded in keeping newly-born animals alive after this operation.

PART III. JANUARY, 1875.

CONTENTS.—XV. Experimental contribution on transfusion, by Professor Ponfick, Rostock. XVI. Critical remarks on the schizomyceta of the digestive tract, and on endocarditis bacteritica and so-called fungus-embolism, by A. Hiller, Berlin. XVII. On diagnostic means and methods for the recognition of bacteria, by the same. XVIII. Acute articular rheumatism, with multiple miliary abscesses, by Dr J. Fleischhauer, Bonn. (Plate IV.). XIX. Investigations on the quantity of heat produced and given off in fresh water, salt water, and carbonic acid baths respectively, by Dr J. Jacob, Cudowa (Plate V.). XX. Smaller communications: (1) On a pathological condition found in the sympathetic of the neck in unilateral sweating, by

Professor W. Ebstein, Göttingen (Plate IV., Fig. 5). (2) Experimental contribution on the action of alcohol in fever, by Dr G. Strassburg, Bremen. XXI. Extracts and reviews. Yearly record on medical and sanitary affairs in Frankfurt, by Dr W. Stricker.

XV. Transfusion of Blood (*Ponfick*).—Without entering into details, it may be stated that this author finds that when the blood of a different species of animal is used in transfusion serious effects follow, which often lead on to death. The red corpuscles of the dissimilar blood undergo disintegration in the vessels of the animal, and the hæmoglobin is set free. This is excreted by the kidneys, and so we have hæmoglobinuria. If a small quantity of blood is used, the kidneys are equal to the elimination of the hæmoglobin, but larger quantities lead to an inflammation of the kidneys, with the usual formation of tube casts and interference with the secretion of urine. If even similar blood is first frozen repeatedly, so as to destroy the corpuscles and set free the hæmoglobin, and then injected, it produces similar results. If dissimilar blood is transfused, therefore, as a therapeutic agent, it must be for the sake of the plasma and white corpuscles, and only in small quantities.

XVI. and XVII. These two papers are entirely critical, and the author is rather severe on the views of many recent authors as to the connection of lower organisms with disease.

XVIII. Acute Rheumatism with Miliary Abscesses (*Fleischhauer*).—The author is only aware of one case having been recorded in which with acute rheumatism there were found miliary abscesses with fungi in them. He has met with a second case of this kind. It had all the clinical features of acute articular rheumatism, but *post mortem* there were found miliary abscesses and infarctus in both lungs, in the kidneys, in the heart, and in almost all the muscles, even the diaphragm. There was also suppurative parotitis and synovitis of a number of joints, thrombosis of the vena cava inferior and commencing abortion. Colonies of bacteria were found in the urinary tubules in the midst of the abscesses in the kidneys, as well as in the lungs and muscles. There was no external wound. This case connects itself with cases of diphtheritic endocarditis occurring in pyæmia, &c., there being here, however, no external wound. It is also interesting in relation to the case related at p. 390.

XIX. Carbonic Acid Water Baths (*Jacob*).—After an elaborate statement of observations, the author comes to the general conclusion that these baths “have a high physiologico-therapeutic value. They produce reduction of temperature of the blood, acceleration of the circulation, derivation to the skin, unloading of internal organs, heightening of the nervous and entire vegetative activity.” It is also stated, on the authority of *Fleischig*, that their use increases the amount of nourishment taken, diminishes the amount of the dejections, and increases the weight of the body as a whole.

XX. (1) Unilateral Sweating (*Ebstein*).—The sweating was on the left side of the head, half of body, and arm, in an anæmic old man of 60. There was no redness with it, and no alteration of the pupil. The author found in the cervical ganglia of this side, especially the inferior, that the tissue presented an approach to that of a vascular tumour, pretty large spaces filled with blood. The ganglionic cells were pushed aside, and interfered with by this lesion.

TRANSACTIONS OF The Medico-Chirurgical Society.

SESSION 1874-75.

SIXTH MEETING, 5th February, 1875.—Dr James Morton, President, in the chair.

Mr Geo. Park, Surgeon, Kilsyth, Mr James Renton, M.B., Rokeby Terrace, Hillhead, and Mr John Barlow, M.R.C.S.E., Town's Hospital, were admitted members.

I.—MAMMARY TUMOUR.

Dr Morton exhibited a mammary glandular tumour, and *Dr Joseph Coats* exhibited, under the microscope, glandular tissue from the midst of the tumour.

II.—CARCINOMA UTERI.

Dr Robert Perry exhibited the parts implicated by a carcinomatous tumour of the uterus, which included the bladder.

Dr Perry mentioned that there was a communication between the bladder and the uterus. The kidneys were much disorganised, very little of the cortical substance being left. No urine had been passed for two days before death; and the patient had died with the symptoms of uræmic poisoning.

III.—THE MECHANISM OF THE MOVEMENTS OF THE RIBS AND STERNUM IN RESPIRATION.

Mr D. C. M'Vail read a paper on this subject. In the paper it was argued that the curvature of the spine, and the oblique position of the sternum in relation to the spine, introduced a mechanical difficulty that, but for an expedient being called in aid, would have rendered immovable—incapable of being raised or depressed—the whole thoracic arrangement. Dr Hutchinson, in assuming the vertical antero-posterior plane of the thorax to be, so far as the mechanical working of the parts is concerned, practically comparable to a parallelogram, overlooked entirely the mechanical difficulty just stated. It was shown next that the difficulty could only be overcome by provision being made for the lengthening, during elevation of the parietes, of each conjoined rib and cartilage, from the third downwards, and that the degree of such lengthening required is greater for each descending rib. This lengthening is effected by the widening of the angle formed by the junction of the rib with the costal cartilage. As this angle widens, the distance between the vertebral extremity of the rib and the sternal end of the cartilage is augmented—the conjoined rib and cartilage increases in length by the opening of the costo-cartilagic angle. With each descending rib the cartilage is longer, and its angle with the rib more acute; and thus with each descending rib the degree of possible lengthening increases. In the higher ribs where little lengthening is required, the cartilages are short, and the angles wide; while in the case of the lower ribs, where great lengthening is needed, the cartilages are long and the angles acute. In this manner is the difficulty overcome which is introduced into the arrangement by the curvature of the spine and the oblique position of the sternum to the spine. In the paper it was next attempted to be shown, by the aid of diagrams and models, that the maximum capacity of the thorax is not reached when the ribs attain to right angles to the spine, as has been hitherto supposed, but is at its greatest when the straight line which would run from the vertebral end of the seventh rib to the junction of the cartilage of this rib with the sternum, is at right angles to the sternum.

Dr Gairdner said that, without pretending critically to appreciate the paper, he would say that it was one of a high order of merit, and he had a strong conviction that its main argument was correct. In his prefatory remarks, however, Dr M'Vail had perhaps gone rather far in saying that the subject had been neglected. The very references which he had made to former enquirers in that field showed that it had not been left uncultivated. His own attention had only been casually directed to it; his ideas in it, he must admit, had been somewhat vague and misty, and Dr M'Vail's paper had very considerably enlightened him on several points. He had no doubt whatever that, when the matter came to be thought out, very considerable practical results would follow. This was indicated by the remark which Dr M'Vail had made on the recession of the lower end of the sternum in extreme emphysematous cases. He had no doubt whatever that Dr M'Vail was correct on that point. There was an essential difference between the emphysema of the child and that of the old man

in regard to the contour of the chest. There was an essential difference between the bronchitis of the old and that of the young in regard to the form of the chest. What Laennec called the barrel-shaped chest was not found in infantile emphysema. He had no doubt that the peculiarities of the shape of the chest in these diseases in old age were in large part due to the ossification of the costal cartilages. The diagrams and models which Dr M·Vail had used to illustrate his position were very ingenious and satisfactory. The whole paper was very creditable to its author, and the society should look with pleasure on the efforts of those who, like Dr M·Vail, while busy working their way in practice, were in addition prosecuting scientific enquiries such as that to which the paper related.

Dr Eben. Watson said that he could not coincide with Dr M·Vail in the general drift of his argument, though he did not dissent from his conclusions. He thought that the error which vitiated much of his reasoning arose from his looking at the chest from too mechanical a point of view. Of the drift of Dr Hutchinson's paper, to which Dr M·Vail referred, he had only an imperfect recollection, but his impression was that the comparing the ribs to a series of parallelograms was put forth by Dr Hutchinson merely as an illustration of the manner in which, through the action of the ribs, the cavity of the chest could be enlarged. No one knew better than Dr Hutchinson that the ribs were not parallel, and did not act like the sides of a parallelogram. He was almost afraid now-a-days to refer to experiments on living animals, but the present subject was one in which one experiment of that kind was worth a dozen trains of abstract reasoning. When the ribs were exposed it was found that different parts of the chest acted in ways very various. For example, the third, fourth, and fifth ribs were the parts at which there was greatest enlargement of the chest in anterior diameter. The ribs were seen not to act parallel at all. Some intercostal spaces were diminished in certain parts, while others were enlarged to the utmost. The acting of the ribs was, in fact, individual, not in unison. Therefore he held that the merely mathematical view of the action of the ribs was quite incorrect. At the same time, he agreed with Dr M·Vail that the mode in which the ribs were joined to the sternum, and the elasticity of the cartilages had much to do in influencing the capacity of the chest. This was undeniable. While, therefore, the conclusions arrived at were undisputable, he felt inclined to deprecate the application of strictly physical and mechanical reasoning to explain adequately the movements of the chest. At the same time, he did not mean these criticisms to deter Dr M·Vail or any other busy young practitioner from such a praiseworthy pursuit as that of physiological investigation.

Mr John Reid coincided with the views expressed by Dr Watson. There was always a false analogy involved in comparing the human body as a whole, or any individual part of it, to a machine. The two things were not comparable in any essential point.

Dr Richmond, Paisley, said that there was much in the paper with which he agreed, and the spirit of intelligent inquiry which it manifested was admirable. One thing would to some extent affect the correctness of Dr M·Vail's conclusions. He had gone on the assumption that the ribs were straight levers, whereas they had a large curvature.

Dr Hugh Thomson said that the human body was no doubt a very complicated piece of mechanism. The mechanism of respiration was one of its most complicated parts, but it was pure mechanism, and not the less so because it was ultimately dependent on vital causes. It was, therefore, to

be explained in exactly the same principles as a piece of ordinary mechanism. With regard to the ribs, it might be said that every one of them had a speciality of form or anatomical connection which differentiated it from every other.

Mr H. E. Clark said that in the discussion not a few of the criticisms fell wide of the mark, from due attention not having been given to the limits of the subject which Dr M'Vail had marked out for himself. That subject was not the general mechanism of respiration, but simply the mechanism of the movements of the ribs and sternum in respiration. Then again, it had been forgotten by some that the lines spoken of were not the ribs, but the axial lines of the ribs, and this made all the difference in the world in considering the problem to be solved. For the solution of it, he thought Dr M'Vail's paper a contribution of great importance. In reference, however, to the physiological arrangements of the cartilages which Dr M'Vail has pointed out, it must be remembered that there was hardly any proper analogy to the joints in the models before them. The cartilages were immovably joined to the ribs.

The President said that it was necessary to bear in mind that Dr M'Vail's inquiry had reference solely to the mechanism of the ribs and sternum, and that the diagrams and models he had exhibited illustrated only the antero-posterior (not the lateral movements of the ribs), as represented by axial lines. To the inquiry thus defined, Dr M'Vail had addressed himself in a scientific spirit; his reasonings and conclusions appeared to be carefully thought out; and whatever might be found to be the true ultimate solution of the problem, Dr M'Vail's provisional or approximate solution would, he believed, be found to be pretty near the truth.

Mr M'Vail, in reply, said that he had not brought forward the subject till after a great deal of observation and thought; and, as an evidence of having used proper scientific caution, he might mention that these models were made in 1870. After the meeting of the British Medical Association in Newcastle, at which he had read a paper on the subject which was in some degree incorrect, he had let the matter lie over, turning it round in his mind on all sides; and even yet he was not in a position to speak with the certainty of absolute conviction on all the points he had touched on, for the subject was undoubtedly a difficult one. He was well aware that some of his views might be open to question. There could, however, be no doubt that in Dr Hutchinson's paper his fundamental position was contained in his parallelogram; he never so much as hinted at the curvature of the spine as an element in the question. And there could be as little doubt that the writers on physiology, up to the present time, who had touched on the subject, had simply reproduced in substance Dr Hutchinson's views. Even Professor Huxley, in his little elementary treatise, had stated the old doctrine in almost the same terms as Hutchinson had done. He had carefully examined the literature of the subject, and he still believed that his statement that comparatively little attention had been bestowed on this subject—a statement to which several members had taken exception—was in no way exaggerated. Sibson had turned his attention a little to it, Jonathan Hutchinson had also written on it, and, more recently, Dr A. Ransome, of Manchester, had contributed to it, and had invented a very ingenious and beautiful machine for measuring the three movements of each point of the chest in respiration. He could not recall at the moment any other recent investigation in that field; but when it was better opened up, he had no doubt that many would be tempted to explore it.

SEVENTH MEETING, 5th March, 1875—Dr Morton, President, in the Chair.

Dr Charles Ritchie, London, was elected an honorary member.

Dr M. Thomas read a paper on

"THE RESULTS OF AMPUTATION IN THE ROYAL INFIRMARY FOR THE 25 YEARS
ENDING 31ST DECEMBER, 1873,"

which was published in the last number of this *Journal* (p. 208).

Mr John Reid, while of opinion that the paper was in many respects a valuable one, thought it might have been of even more practical service had it given the comparative statistics of the results of amputation before and after the introduction of the antiseptic system, some eight or nine years ago. Such a series of statistics would have brought out whether that system, as weighed by its results, had any claim to take its place as better than, or equal to, other recognised modes of treatment. He had been struck, in listening to Dr Thomas's paper, with the increase of the death-rate after amputation in the new hospital. Many people would have expected quite a different result. But the fact simply showed that the health of an hospital, like that of the inmates of a house, was affected injuriously by the newness of the materials, the ill-seasoned wood, and, in fact, by everything that tended to detract from comfort. He would attach less importance than was usually done to insisting rigidly on so many cubic feet for each patient. With regard to pyæmia being caused by spores or germs, he looked on this theory as being in the position of an unproved hypothesis, and, as such, it should not influence the practice of surgeons in any way. Pyæmia had been attributed to some subtle influence or poison which could even attach itself to the walls of the hospital. This was also unproved. The larger the number of cases of amputation the greater the probability that the percentage of deaths would be less. Dr Morgan, in his work on "Probabilities," had proved this fact.

Dr William Macewen said that it would be more correct to state that, the larger the number of cases the greater the probability of the elimination or attenuation of the sources of error. But it certainly did not follow that the mortality would be relatively less. The question of the comparative salubrity of old and new hospitals is one which would appear well fitted for the application of the statistical method, but it would require an extensive field of observations. The figures of one or even two hospitals would not do. For several reasons, the comparison made by Dr Thomas as to the salubrity of the old and new part of the Infirmary was one that could go a very little way to settle the point.

Dr Watson said that he was glad that the results of amputations in the Royal Infirmary compared favourably with those of other hospitals. The results which Dr Thomas had obtained by comparing together different operations, had not materially added to his knowledge of the relative fatality of these operations. With regard to the matter of the temperature of the wards; he had had assigned to him, at his first appointment to the hospital, about 1855, a wooden building which had been erected at the cholera epidemic in 1849. The building at that time was much the worse for wear, full of draughts which came in from all points. As a result, there were several cases of pneumonia and similar affections, but very few cases indeed of pyæmia. With regard to the carbolic acid treatment of wounds, he was an advocate of the system, but it was a mistake to suppose that it would always prevent pyæmia. It would be a very extraordinary thing if it did that. The treatment could only affect the wound and the

state of the wound, but pyæmia did not always come from an open wound. They might have pyæmia in any case of suppuration, or even before suppuration. Pyæmia, in fact, was a disease of the blood, like other fevers, arising under mysterious conditions and circumstances, and not always due to the state of the wound, though it always produced a certain state of the wound. It should be called Surgical Fever. He thought the practical suggestions made by Dr Thomas of great value. If they had a large airy set of apartments for cases exceptionally liable to risk, it would be a great improvement.

Dr Dougall said that in regard to the cause of pyæmia, Dr Burdon-Sanderson had expressed the opinion that bacteria were the cause of the affection. So far as he recollected, in the paper on the subject published some four years ago by Dr Sanderson, he did not say that bacteria would constitute the specific germs of infection, but were the carriers of infection. But in a recent communication he went more minutely into the subject, and showed that bacteria were not the producing cause of putrefaction, but that, as a pre-requisite condition of their development, putrefaction must have begun. With regard to the use of carbolic acid in hospitals, it must be remembered that it is antiseptic in its operation, and that if the poison of pyæmia be looked upon as specific, by using carbolic acid they were simply using means to preserve, not to destroy the poison. If, on the other hand, it was used for the purpose of preventing the generation of these poisonous germs, such a use was at least permissible in theory. As showing the preservative power of carbolic acid, he would mention one experiment which he had performed, and he desired the members of the Society to perform it themselves, and verify his result. He took a tube or two of vaccine lymph, and mixed it with one-fifth of a grain of carbolic acid in solution. This was exposed on a slide, and in a short time the liquid became milky, from the coagulation of the lymph. He had with this mixture vaccinated a child within 24 hours, but without any success. If, however, they kept the mixture in this way for 10 or 12 days, dissolve it in water, and then vaccinate with it, as he had done, the operation would be successful. This experiment proved that the action of the carbolic acid was preservative of, or at least not destructive of, the vitality of the vaccine virus.

Dr Watson said that some things mentioned by Dr Dougall appeared to him very extraordinary. That gentleman had stated he had coagulated the albumen of vaccine lymph, and that subsequently the lymph conducted itself as if no such coagulation had taken place. Now he (Dr Watson) had always believed that when albumen was coagulated it was *dead*. Yet, in Dr Dougall's hands, it appeared to have come to life again. Was there not some error lurking in some part of the experiment?

Dr Dougall, in reply to Dr Watson, said that the coagulation of the lymph, he believed, prevented it from entering the capillary vessels. In the course of a few days, however, the carbolic acid became vapourized, and the lymph was made soluble by the addition of water, and was thus made able to enter the dermal vessels. Dr Watson's phrase of coagulated lymph being "dead" was one which he had never before heard. He presumed that he meant by it that lymph when once coagulated could not be dissolved. No doubt albumen coagulated by heat was insoluble in water, but it was soluble in an alkali. But, on the other hand, all precipitates of albumen by acids were soluble in water. There was therefore nothing extraordinary, in a physiological or chemical view, in his statement that he

had coagulated lymph by carbolic acid, and subsequently dissolved the albumen thus coagulated in water.

The President said that the paper was a very interesting one, and it was gratifying to hear that they were making progress in regard to the diminution of mortality. Whether this was due to improvements in surgery, or improvement in the *physique* of the population, he would not undertake to say. The prevention of pyæmia was not necessarily or entirely a hospital question. Not long ago a statement was made in one of the London societies that there was as much pyæmia to be met with in private practice as in the hospital. That might be an exaggeration, but at all events it was enough to show that it was not necessarily a mere hospital scourge. The apparent fickleness with which it attacked one ward and exempted another from its visits, was very puzzling. At the present moment his own ward happened to be exempt, but other wards on both sides were suffering. How could one ward, situated between other two which were tainted, completely escape, and that too for months?

Dr Thomas, in reply, thanked the Society for the reception his paper had received. It was only by the accumulation of large masses of statistics that they were able to get at reliable conclusions in regard to the mortality after different kinds of operations. The publication of the comparative statistics of different surgeons was not for him to undertake. It might be done by the surgeons themselves. With regard to the antiseptic system, he was personally favourably impressed with the results which had attended it. He had observed that those house-surgeons who carefully practiced this treatment were generally the most successful. He was under the strong impression that Dr Dougall had misapprehended Dr Burdon-Sanderson's position in regard to the theory of infection; but, as he spoke from memory, he would not at present contradict Dr Dougall's statement.

EIGHTH MEETING, 2nd April, 1875—Dr Morton, President, in the Chair.

Dr John Dougall read a paper on

“THE PREVENTION OF PUTREFACTION, AND THE DESTRUCTION OF CONTAGIA,” which was illustrated by specimens. See page 313 of this number of the *Journal*.

Mr John Reid had listened with much pleasure to the paper, the more so from Dr Dougall having struck out for himself an independent line of research, and kept himself from being biassed by the notions prevalent among the modern so-called antiseptic school of surgery. It was somewhat startling to find that carbolic acid, to which that school assigned so prominent or exclusive a place in their treatment, was by Dr Dougall's experiments proved to be possessed of comparatively small antiseptic properties; and also that boracic acid, which Mr Lister had been using as an antiseptic, was shown to have no antiseptic powers at all. It was also somewhat remarkable that benzoic acid, which had been long ago used in gangrene of the lungs, was proved to be so effective an antiseptic. These facts showed of how little value were theories not carefully based upon sound observations.

Mr William Jas. Fleming said that, in the very elaborate paper of Dr Dougall, there were not a few things with which he could not agree. For example, Dr Dougall had affirmed that putrefaction took place *before* the development of bacteria or other organisms, as well as after their development. This, of course, was purely an experimental question, and he would like to

know the evidence on which the first part of the statement was based. Then, again, he would like to know what were the marks, apart from the presence of organisms, by which Dr Dougall would identify a putrescent fluid. A bad smell was by no means a necessary indication of putrefaction. Liquids emitting putrescent smells were often free of bacteria. He might mention, as an instance of this, the fact that the discharge from wounds antiseptically treated, in which a microscopical examination could detect no organisms whatever, smelled abominably. The addition of salicylic acid to the dressing had the effect of deodorizing the discharge, but without preventing putrefaction. Whether this was caused by a chemical combination of the carbolic acid with the agent was doubtful. It was certain, therefore, that liquids did emit a putrid smell, which were in no other sense in any way putrescent. In regard to Dr Dougall's use of the terms "bacteria" and "vibriones," he did not make out from the paper whether he distinguished the one organism from the number by the number of joints, or simply by the spiral motion of the latter.

Mr Barlow had often examined, under the microscope, the discharges from wounds treated antiseptically, and he could corroborate *Mr Fleming's* statement that they were free from organisms of any kind.

The President said that unless on the principle quaintly enunciated by the old Scotch physician, "ane bad theory was better than nane," the germ theory was hardly a theory at all, as it neither rested on nor explained known facts. Even by the disciples of the antiseptic school it was freely admitted that the theory was the weakest part of the system; and the position now taken up by many of them was in effect this, whatever might be said of the theory the practice was successful. He was satisfied that the members of the Society would take with them, from hearing Dr Dougall's paper, not a few suggestive thoughts. Dr Dougall had taken up a discriminative position, one in certain aspects quite his own, though his conclusions agreed with those arrived at by other investigators. A charge of something akin to heresy had been brought against those who held that the elemental forms of life had their origin in any other way than that implied in the aphorism *omne vivum ex vivo*. They were unjustly accused of being materialists. He held that the doctrine enunciated in effect by Leibnitz, that life was not limited by an impassable line, but rather pervaded all parts of the universe, opened up a far grander conception of the plan of the Creator than any other system.

Dr Dougall said that what he had stated in regard to the relation of bacteria to putrefaction was that there could be putrefaction without bacteria, and bacteria without putrefaction. Therefore they were not necessarily connected as cause and effect. There was putrefaction without bacteria in the potass solution of which he had spoken. Bacteria, in fact, could not live in it. In regard to the morphology of these organisms, he had not entered on that subject at all, but he might state that there was no way of discriminating bacteria from vibriones when the organisms were at rest. With respect to the germ theory, he believed he was correct in saying, that with the exception of Pasteur and Lister, it was not now upheld by any person of eminence in the world of science.

NINTH MEETING, 7th May, 1875.—*Dr Morton*, President, in the chair.

I.—SARCOMA OF THE OVARY.

Dr Charteris read Notes of a case of Sarcoma of the Ovary.

Dr Joseph Coats said that such cases were of the rarest occurrence. He

had seen one other case in which the tumours were larger, both ovaries being affected. Each of the tumours was the size of a child's head.

Dr Foulis said that the theory propounded for these tumours assigned to them a syphilitic origin. The pathological character of the structure no doubt favoured the idea of such a cause, though the fact of the uterus not being involved would point to a different origin. This was the only case of the kind which he had seen. It was somewhat remarkable that they were so rare, as the abundant stroma of the ovary would seem to afford a suitable nidus for them.

Dr R. Scott Orr said that one case had occurred in his practice, which had clinically so many points of resemblance to the present, that he was inclined to put it in the same category. The patient had disease (apparently malignant) of both ovaries.

Dr Gairdner said he had seen one case of this disease, but unfortunately a case without any good history. As he was at the time not prepared to assign any pathological position to that case, he had not recorded the facts. He recollected, however, that only one ovary was implicated, and that the tumour was three times the size of those in the present case. The point of interest in the present case was the evidence as to the rate of growth. From the fact that both ovaries were affected, and that the woman ovulated fifteen months before, which one could hardly believe that she did with even the beginnings of the disease upon her, the growth had evidently been very rapid.

II.—CALCULOUS DISEASE.

The President exhibited several calculi of peculiar shape.

III.—DISEASE OF BONE.

The President showed several pieces of carious bone picked out from the acetabulum of a man labouring under Morbus Coxæ.

IV.—BISCUITS FOR DIABETES.

Dr Charteris exhibited some cases of biscuits for patients with diabetes, manufactured by Mr Walker, Bishop Street, Glasgow. They were more palatable than those of London manufacture, and contained, one specimen 14 per cent., and another 4 per cent. of starch. He had used them in the Infirmary with much benefit in cases of diabetes.

V.—"CASE OF EMPYEMA, TREATED BY PARACENTESIS THORACIS."

Dr Macdunn read notes of a case of empyema which he had treated by paracentesis. After doing so, he said that his object was to draw out the opinions of those who had more experience in the use of the aspirator than he had as to the value of that treatment. What were the circumstances under which paracentesis should be resorted to? Since the introduction of the pneumatic aspirator there could be no doubt that the operation had been tried much more frequently than in former times. Till of late years the operation had been looked on as justifiable only as a last resource, such as when life was in imminent jeopardy from orthopnea, syncope, or some other cause. Now, however, a bolder policy had been strongly recommended and practised. The Late Dr Anstie gave the following among the circumstances under which paracentesis should be performed:—When the quantity of fluid

was so large as to fill one pleura, and begin to encroach on the lung of the other side. Also, in cases of double pleurisy, where the fluid occupied a space equal to half the combined dimensions of the two pleural cavities: and in cases in which there was large effusion with fits of orthopnea. In the case under consideration there could be little doubt of the expediency of the operation. Life was in jeopardy, and the only question with him was whether it would not have been better to have tapped at an earlier period. His own impression now was that he ought to have operated at a time when the fluid would have been more serous. The prognosis in this case was doubtful; there was considerable chance of the chest again refilling.

Dr Macleod said that with regard to the class of cases in which paracentesis should be practised, it was generally admitted that the operation should be attempted in cases of acute pleurisy with serous effusion, provided the diagnosis of the exact state of matters was rendered sufficiently clear. But the operation was always one of risk. In cases of simple effusion he imagined that if other means had been exhausted the operation was perfectly justifiable. The presence of pus altered the case. It was generally best to make sure of what they were dealing with, which, by means of the exploratory tube and suction ball of the aspirator, they could always do. There had been a great deal of discussion regarding the danger of the admission of air. Some people believed that air did very little harm. There were no doubt cases constantly occurring which seemed to prove that the admission of the air into the pleural cavity *per se* did little harm; but the evil it might effect in causing the decomposition of pus was another matter. In a case in which pus was present the admission of air was a serious matter. With regard to the instrument for operating, he had used the aspirator repeatedly, and he was by no means clear that its superiority was so decisive as was represented. In regard to abscesses its use was not seldom conspicuously a failure, and it was often necessary, after repeated attempts with it, finally to make a free incision with the use of carbolic oil. The present success of *Dr Maclaren's* case settled little in regard to the final result. As a rule, such cases were in the end very unsatisfactory. The result depended on the constitutional state of the patient and the state of the lungs. He did not think it a matter of consequence to drain the whole fluid out of the chest. The system of forcing it out, with a view of emptying it, at the imminent risk of setting up bleeding from the surface of the lung and pleura, was a mistake. With regard to the place for paracentesis, *Dr Maclaren* stated that he had made the opening about four inches below the angle of the scapula. His (*Dr Macleod's*) rule had been to take the level of the nipple, half way between the spine and sternum. There was an old observation in *Bell's* writings which confirmed him in regard to this point. *Bell* stated that in cases of the bursting of empyema it was always either between the fifth and sixth or sixth and seventh ribs.

Dr Gairdner said that his experience of paracentesis thoracis greatly antedated these modern discussions on the subject. At the commencement of his practice he adopted, as the result of the earlier periods of discussion, very much the same attitude towards this operation which he did now. His belief then was that in cases in which the pleural cavity was charged with fluid, that if they let off the excess of fluid, and admitted no air, they did the best they could under the circumstances. In one point, however, he diverged from the practice of *Trousseau* and other early writers. His maxim at that time was not to be too keen to operate at an early stage

of the disease. There were not a great many cases of acute pleurisy which were dangerous in the acute stage of the disease, say within the first six weeks. In this early stage he was always doubtful as to the propriety of perforating the chest. The danger then, when it existed in well-pronounced empyema, sprang from the violence of the fever, and not from pressure. On another point he formed a strong opinion. To empty the pleura he held simply to be impossible. When the cavity became filled, the whole membrane got a set which it did not lose, so as to return to its original state when a perforation was made. What they could do was to draw off the excess of fluid, and this should be done without any degree of force. The general result of his experience in these early days was this:—Don't be afraid to tap; there could be little harm resulting; but do not be tempted to do it too early. Guided by that practice, he found, as a practical result, that placing side by side the cases of those tapped and those not tapped that the one class recovered just about as well as the other. Nevertheless, when he became acquainted with Dr Bowditch's instrument, he at once saw the importance of it, especially in regard to the exclusion of the air. In every case it was the aspirator which he now used, with the suction pump. The result of his experience was to make him take a middle position in regard to this question. Some of the French physicians ride their hobby to death. They are, beyond all doubt, using the aspirator in cases which would get well without it. But there are cases in which the instrument could be used with benefit. There was another point on which he felt strongly, and on which he agreed with Dr Macleod. The practice of using force to empty the cavity was much to be reprehended. He had seen cases in which there had been an increase of fever and other symptoms from this practice. The tendency was (especially among the French physicians) to use too much force. The very minimum of force was all that was necessary or safe. When he was in Berlin two years ago, he saw the aspirator constantly in use, and used on a principle which he was satisfied was a fallacious one. The principle was that fluid *per se* conduced to tubercle. There was no proof of that, and even if it were true, it was, besides, quite certain that neither German nor Frenchman ever took out so much pus as not to leave enough behind to produce all its bad effects.

Mr John Reid said that he considered that these cases of effusion into the chest, of which so much was heard now-a-days, were the opprobrium of the profession. When he read of so many cases now requiring perforation, he could not but recall a period in the early days of his practice when cases of empyema were very uncommon indeed. The prevalence of empyema clearly indicated a defective mode of treatment. In his time he was sure he had bled at least 250 cases of acute pleurisy, and he never had, as a result, one bad case of empyema. He had seen no reason to give up bleeding in cases of acute pleurisy and pleuro-pneumonia. And speaking generally, congestion of the lungs and other organs was better treated by bleeding freely than by any other method. It was quite a mistake, also, to suppose that people in towns were now so defective in vital stamina as not to be able to bear this kind of treatment. As a matter of fact, he had found that they bore depletion better than the often sickly and ill-fed dwellers in country villages.

Dr Richmond said that he could testify that there were a great many cases of pleurisy with effusion fifty years ago. Bleeding, he admitted, was yet an admissible mode of treatment in extreme cases, and he so far agreed with Mr Reid that cases of congestion often yielded to bleeding. He agreed entirely as to what had been said as to the time for the opera-

tion of paracentesis. It would be for the credit of the profession if the operation were had recourse to only in cases of urgency. He had himself had experience in two cases in which it had been successful. One was a child, six years of age, who had an attack of pleurisy with effusion after scarlet fever. In spite of all his efforts the chest continued to expand, till the shoulder was lifted up very considerably. His instrument was an exploring needle. He extracted as much pus as would fill two soup-plates. The fluid, however, returned when the patient was absent in England; he was re-tapped there, and when he came back, he was markedly deformed from the hollowness of the left side. The other case illustrated the rougher resources of the medical art. The man, who was drunken in habits, took fever, which was followed by empyema. Symptoms of urgency set in, and Dr Richmond resolved to make an opening to let out the fluid. This, however, was a matter of great difficulty. The patient wriggled and shrank so much, that at last, not to be baffled, he thrust two of his fingers into the cavity, and a whole basinful of fluid came off. It was no doubt very rough treatment, but the patient made a very satisfactory recovery.

Dr Cameron said that, in considering the applicability of this treatment, it was well to discriminate between two forms of empyema. Dr Maclaren's case, if he understood him aright, was one in which there was a tendency to pointing. In such a case it was a very easy matter to make an incision. In some of these cases, if they did not make an opening sooner or later, the empyema would burst. In such cases there could be no question as to the propriety, in circumstances of urgency, of operating. But there was another class of cases, with which they were all familiar, in which, though there could be no doubt of fluid being present, there was no pointing. In the former class of cases, the best treatment was a free incision made with antiseptic precautions. But in the second class of cases, in which there was no pointing—indeed often a concavity of the chest—it was very difficult indeed to get at the fluid. Often only the smallest quantity would come. One of the most remarkable cases of empyema treated successfully by aspiration was one that occurred in the Glasgow Fever Hospital, and has been recorded by Dr Lilly. The pus in that case always reaccumulated, so that the process of evacuation had to be constantly repeated every day for some weeks, if not months. In regard to the use of the aspirator, there was one pitfall, of which those who used it should be aware. The great suction power of the instrument was such that sometimes it cupped the cavity of a large quantity of blood. He had himself had a case of this kind.

Dr Perry said that in regard to Dr Maclaren's case, he was afraid that the fluid would soon again accumulate. There could be no doubt that their experience of this line of treatment went very much to moderate the sanguine anticipations with which it was advocated a few years ago.

Dr Scott Orr said that he had some experience with the aspirator. He thought that if they carried the rule of using it only in a case of urgency to an extreme length, they would sometimes be too late in using it. Some had attempted to justify the operation only when used after a certain number of weeks. He did not think that any rule introducing the element of time would work. The guide should be the dyspnoea or orthopnoea, and generally the pressing nature of the symptoms. He was inclined to think even that the operation might have more chance if carried out before the urgent symptoms appeared. Dr Orr then gave a number of statistics bearing on the mortality of the operation, from the published cases of Dr Hamilton Roe, Dr Brady, and Dr Tuke.

The President said that the discussion had been very interesting and exhaustive, and it was clear enough that there was among the members of the Society a pretty close approximation to unanimity of opinion on this mode of treatment.

Dr Muclaren said that his purpose in introducing the subject had been amply served, as the discussion it had elicited had been a valuable one. He was much struck with the unanimity of the opinions expressed that evening. The question raised was obviously one which could be settled only by experience. The experience of the members of that Society appeared to run strongly in the direction of retaining the old rules and conditions under which the operation of paracentesis thoracis should be performed. In reference to what *Dr Cameron* had said, he might mention that his case was not exactly one in which there was "pointing" in the sense of there being a circular swelling, red at the surface, between the intercostal spaces.

TENTH MEETING, 15th June, 1875.—*Dr Morton*, President, in the chair.

This meeting partook, in great part, of the nature of a conversazione.

The microscopes acquired by the Society were shown, and various preparations demonstrated under them and other instruments. *Dr Joseph Coats* explained the various appliances connected with them.

Dr D. Foulis showed a tumour from the axilla of a child two and a-half months old, exhibiting the character of spindle-celled sarcoma.

Dr Foulis also exhibited a heart, showing extreme calcareous degeneration of the aortic arch, with rupture of the left ventricle. The patient was 47 years of age, and had been picked up near a limekiln, in an insensible condition, by the police, and lived a week after being brought into hospital.

Dr Robert Watson exhibited a preparation of cancer of the testicle, which he had excised.

Mr James T. Whittaker exhibited the following drawings:—

- (1.) Gums in a case of scurvy.
- (2.) Legs in a case of scurvy.
- (3.) Various illustrations of strumous physiognomy.

Glasgow Pathological and Clinical Society.

SESSION, 1874-75.

SEVENTH MEETING, February 9th, 1875.

Dr A. Wood Smith showed a specimen of EPITHELIAL CANCER OF THE STOMACH, removed from a man of 63 years of age. The case presented during life some difficulty in physical diagnosis, as the tumour could not be differentiated from an evident enlargement of the liver. There was

neither vomiting nor alteration in the character of the fæces. The man had been a bill-poster, and a hard drinker. He complained of nothing beyond anorexia, and a shooting pain extending from the left to the right hypochondriac region, and downwards to the left lumbar region, aggravated at night and by pressure, and which he compared to the "running up and down of a ferret" in his side. The man had a very cachectic appearance, and became extremely emaciated before death, which occurred by pure asthenia. On examining the abdomen a general flattening was noticed, and on percussion the left lobe of the liver was found to be enlarged, the dullness extending to the left hypochondriac region. No nodulation could be made out. The report of the *post-mortem* examination is as follows:—On opening the abdomen the stomach is found to be adherent to the neighbouring parts, and on removing these in situ, and opening the stomach, the following conditions are observed:—The stomach is the seat of a large tumour which occupies portions of the lesser curvature and anterior and posterior walls. It ends abruptly at the pylorus, and measures along the lesser curvature $3\frac{1}{2}$ inches; in a direction at right angles to this it measures 4 inches. The tumour is very much ulcerated in its central parts, and its margins are exceedingly prominent and warty looking. The transverse colon is adherent about its middle, and a somewhat tortuous communication exists between the ulcerated tumour and the colon. The tumour is also adherent to the liver, and there are around it a few enlarged glands. The liver is considerably smaller in size than usual, and there are in its substance pretty numerous small white growths, the largest not exceeding a pea in size.

Dr Wood Smith also showed the bladder of a man, aged 62, who died from CANCER OF THE BLADDER AND KIDNEYS. The symptoms during life were hæmaturia, frequent micturition, and pains over the kidneys; the urine was of a smoky tint from blood, but no tube casts could be found. Pneumonia on the right side appeared, and after death cancerous nodules were found under the pleuro-costalis.

Dr Gairdner introduced a patient who had recently recovered from an attack of PITYRIASIS RUBRA ACUTA (Devergie), for which he had been under treatment both in the Royal Infirmary and in the Western Infirmary. The case was one of a certain historical interest in Glasgow, inasmuch as its commencement had been described in an article, by the late Dr McGhie, in the *Glasgow Medical Journal* for 1858, vol. v., p. 431; and during nearly seventeen years past the patient has been repeatedly under observation in numerous invasions of the disease, separated by intervals of years, during which he states himself to have enjoyed tolerably good health. Each invasion lasts, as a rule, for months, and consists of a number of successive desquamations of the cuticle over the entire surface of the body. The invasions have been, on the whole, diminishing in severity, and, notwithstanding the gloomy prognosis held out by Devergie and others in this

disease, there seems a fair presumption that he may survive it, as his organs are even now perfectly sound, and although emaciated he is by no means in very greatly impaired health. The object of presenting this man to the Society, however, was not to describe the disease at large, but to give evidence of one feature of it which is overlooked, and even denied by some authorities—viz., the distinctly febrile character of the invasion, especially in its earlier stages; and the effect of this upon the growth of the nails. In this man the nails have always been (when under observation of late years) much curved, though without much, if indeed any, clubbing of the finger ends. In the last invasion of Pityriasis, which began in the first days of October 1874, the temperatures were carefully noted for nearly two months, every morning and evening, from October 3rd onwards. The maximum temperature noted was 103.8° on 5th October, but for some days after the commencement of the invasion the temperatures were oftener above than below 100° , and it was not until the 8th October that normal temperatures were recorded. After this, although the fever was slight, it was still occasionally apparent, as on the 17th October, when 101.2° M. and 100° E. are noted, and on 26th-28th October, when a new maximum of 102.6° was attained, with adjoining observations of 101.8° and 100° . In general, the morning temperatures were normal or even subnormal on the majority of days, except at the periods above referred to; but the evening temperatures often presented a rise, which, though not altogether beyond the possible limits of health, was distinct in comparison with the morning range in this man. In the end of November the temperatures of 101.4° , 100.8° , 100.6° , are again noted in connection with a renewed attack of desquamation. The effect of all this constitutional derangement is seen in the nails which are not only, as stated, much curved, but present a very evident and deep transverse furrowing, corresponding in date with the first febrile period, the portion of nail which emerged at that time being comparatively soft and thin, and being succeeded by a more natural portion, and this again at an interval by another furrow. It is rather remarkable that in all the numerous and complete desquamations that have attended this disease during sixteen years, the nails have only once separated—viz., during the first, which was also the most severe attack of all. During the first attack, also, the hair came away a good deal, but in the latter attacks scarcely at all, and now, although dry and scurfy, and a little grey, it is abundant all over the head.

Dr Alexander Robertson showed the LUNGS OF AN INFANT, who for a week after birth seemed healthy, when bronchitis set in; an extensive atelectasis was diagnosed. A large portion of both lungs was found collapsed, and patches of emphysema existed at the margins.

Dr Knox presented an EMPHYSEMATOUS LUNG. A large vesicle occupied the dome of the pleura, and was attached to the lung by a very small flattened pedicle; traces of calcareous degeneration were evident on the wall of the

vesicle. Both lungs were slightly emphysematous throughout, but this was the only large vesicle found. The lung was injected with spirit from the bronchus to preserve it, but none entered the vesicle.

The *Secretary* showed, for *Dr G. H. B. Macleod*, a fresh specimen of SCIRRHUS just removed from the breast of a healthy looking woman, aged 46. It had grown slowly, having been first observed two years ago. It was only very slightly embedded in the gland, but stood quite out like a great nipple. There were no glands affected, no puckering of the skin, or retraction of the nipple. *Dr Macleod* intended merely to excise the growth, and the base from which it grew, if on section it was found non-malignant; but, on cutting it, he saw at once that it was necessary to remove the whole breast.

Dr Joseph Coats had examined sections, and found the typical structure of scirrhus.

From its unusual situation, it was referred to a committee for report.

The *Secretary* also showed, for *Dr Macleod* a tumour removed from the outer side of a knee joint of a woman, aged 56. It had been growing since July, and was occasionally very painful, but had not implicated the joint. It was supposed by *Dr Macleod* to be malignant, and was removed with all the skin, &c.

Dr Joseph Coats regarded the tumour as a SPINDLE-CELLED SARCOMA, or recurrent fibroid.

It was referred with the previous tumour to a committee for report.

Dr Macleod also forwarded for exhibition the upper articular EPIPHYSIS OF THE FEMUR, which was spontaneously extruded from the hip of a child aged 14. He had since broken up some fibrous adhesions, and the limb was likely to do well.

A long and interesting report of the committee appointed to consider the BRAIN OF AN APHASIC shown at the last meeting of the Society was produced and read. This was published in the *British Medical Journal*, May 1, 1875.

EIGHTH MEETING, March 9th, 1875.

Dr H. C. Cameron showed an LEULIS just removed; also a CYSTIC TUMOUR OF MAMMA, which was referred to a committee for report.

Dr Wood Smith presented an elderly man with a large POLYPUS in posterior nares.

Dr George Buchanan presented a specimen of CANCER OF THE KNEE.

Dr Thomas Reid presented a man, about fifty years of age, with a TUMOUR IN THE CILIARY REGION. The tumour occupied the lower third of the anterior chamber, it had a nodulated appearance, and extended

backwards to the equator of the eye; there was separation of the retina. The duration of the disease seemed to be about twelve months. Asenucleation would likely be required, and the specimen might come up hereafter, he thought the appearances might interest the members.

Dr Knox read a report on *Dr Robertson's* case of DEFECTIVE CORPUS CALLOSUM, prepared by the committee appointed. See *Glasgow Medical Journal*, April 1875, for report *in extenso*.

Dr Gairdner presented a number of specimens illustrative of MELANOTIC CANCER, from the body of a female patient, aged 40, who died in the Western Infirmary. The parts chiefly affected were the liver, omenta, mesentery, and peritoneum; in a minor degree the pleuræ, lungs, and kidneys. The heart was normal as to size, but had been during life the seat of a very peculiar murmur which, with the appearances presented, formed the subject of a separate communication and report. The uterus was occupied in its posterior wall by a rare form of growth, which was separately exhibited to the Society by *Dr Coats*, as it did not appear to have any clinical or pathological relation to the other facts of the case. Excluding for the moment the cardiac phenomena, the whole clinical history that could with any probability be associated with the enormous masses of disease presented did not extend back much more than four weeks before death. The patient, an intelligent and respectable married woman, affirmed most positively that, with the exception of several rheumatic attacks during the last four years (the latest of which was three months before admission), she had always enjoyed good health; the catamenia had, however, ceased since the first severe attack of rheumatic fever, which had confined her to bed for five months, and had left her very weak. After this, she had suffered from palpitation, but had no dropsy, and had been attending to her household duties up to a fortnight before admission. At that time she caught a severe cold (as she thought, owing to a washing), and immediately afterwards her abdomen began to swell so rapidly that in two days she was as large as she ever became afterwards, and also suffered seriously from cough and difficulty of breathing, especially at night. These symptoms were accompanied by a great falling off in the quantity of her urine, which became very high-coloured. The bowels had been costive throughout. The family history was without significance. The patient was under observation only from 3rd to 18th February, 1875, making the whole duration of the fatal illness, as far as could be ascertained, about a fortnight before, and a like period after, her admission to the Infirmary. The axillary temperatures (during the period of observation taken twice daily) were very little elevated, the absolute maximum recorded being 100.2° F., and on one other occasion only 100°; mean of 14 morning temperatures, 98.8°; of 13 evening, 99.3°; mean difference, 0.5°; maximum of oscillation between evening and morning, and *vice versa*, 1.2°, corresponding with the evening maximum temperature of 100.2° above noticed. The

quantity of urine passed daily averaged 12 oz., varying between 6 and 16 oz.; for several days it was not measured, owing to intercurrent diarrhæa, probably the result of treatment. The urine collected was high-coloured, and of high sp. gr. (1035); it sometimes deposited urates and was at other times clear; by all the tests, successively and carefully employed on several occasions, it proved to be non-albuminous, but a very peculiar reaction with nitric acid attracted attention from the first, and was throughout observed—viz., a darkening of tint almost amounting to a sooty discolouration, with obvious loss of transparency and even something like precipitation, though nothing could be collected as a distinct sediment. A similar darkening of the urine took place spontaneously after keeping it for some time, without loss of acidity or distinct decomposition. Dr Finlayson made special observations on this peculiar reaction, and a portion of the urine was committed to Professor Ferguson, but without any very definite result in the way of chemical analysis. Almost the whole of the positive symptoms connected with the fatal disease on admission were those of abdominal distension, which was obviously in part from fluid in the peritoneum, but in part also from a much enlarged liver. There was in a minor degree œdema of the legs, but this was ascertained to be of later origin than the abdominal swelling, and the lungs gave signs of œdematous congestion. Five days before death severe pain occurred in the abdomen, which was not allayed by external soothing applications, and was accompanied by considerable perspiration and a rapid pulse (112), but not by any appreciable increase or diminution of surface temperature. This severe pain recurred at intervals, and at last became constant, being only relieved by hypodermic injections of morphia for a short time, and ultimately producing exhaustion with a fatal result on the 18th February.

The *post-mortem* examination showed a great accumulation of dark brownish fluid in the peritoneum, but scarcely any adhesions, and no recent lymph. This fluid did not react like the urine, as above described, with nitric acid, nor could it be definitely stated to differ from ordinary peritoneal serous effusions, though somewhat darker in colour. The liver was much enlarged, extending nearly to the umbilicus and right iliac margins. Dr Coats estimated its weight at not less than 8 lbs. The masses of cancerous matter in its substance were mostly of a bistre or soot-black colour, more or less deep, but a few of them were quite free from this peculiar pigment, and resembled ordinary cancerous tubercles both in form and colour. It appeared, however, to Dr Gairdner at the time that the non-pigmented deposits were not only smaller, but, judging from their consistence and obvious structural characters, probably of an older formation than the pigmented, which were larger, softer, and apparently less circumscribed than the others. The largest of the nodules was about two inches in diameter, and slightly umbilicated. Dr Coats also found a considerable amount of infiltrated pigment, apparently replacing the normal hepatic tissue, without any distinct nodular arrangement. The greater and lesser

omenta, and the mesentery, especially near its attachment to the small intestine, were everywhere closely occupied with growths which, by crowding together, constituted a thick mass of morbid material, in which the natural structures were almost lost. In the greater omentum these growths individually varied from a very small size up to that of a filbert, the most of them, however, being about the size of peas, and having very much the appearance and colour of preserved black currants. Most of them were of soft consistence, and some of them after a little keeping were almost diffuent on section. The rest of the peritonæum, and to a less extent the pleuræ, were occupied in many places by similar growths, mostly, however, flat and sessile, up to a diameter of a quarter of an inch, and varying from a brown to a pale tint. In the substance of the lungs a few similar growths were found, but of small size. In the kidneys (which in other respects were normal), a few very minute black deposits were found, not larger than pin-heads.

Dr Joseph Coats examined many of these growths microscopically, and made a careful and detailed report, of which the following is an abstract:—The nodules on the mesentery of the small intestine showed an enormous number of cells, having various shapes, mostly rounded, but many tailed, and a few distinctly spindle-shaped. The cells were by no means all pigmented, even where the colour of the growth, as observed by the naked eye, was deep brown or almost black. On the contrary, the pigmented cells were in a minority, usually in a proportion of one pigmented cell to four, or from this to ten, unpigmented. The pigment was of a brown colour, and the cells were apparently stained with it; the staining being of various degrees in depth, and frequently affecting not the whole, but only a part of the cell. Examined in the fresh state, it was particularly noted that the pigment was not, so far as appeared, granular, but rather a simple brown staining. Both pigmented and colourless cells were the seat of fatty degeneration; and *Dr Coats* was convinced by observation of these with Hartnack IV. 7—draw tube, that any appearance of separate pigment granules which might have been supposed to exist, was really dependent on fatty degeneration in the pigmented cells. The addition of liquor potassæ produced no perceptible alteration in the colour of the pigment, although by degrees destroying the cells.

Dr Joseph Coats showed the uterus in the case detailed above. It was normal in size, and its cavity was normal. In its posterior wall, towards the right side, a somewhat bulky tumour was felt, on cutting into which there was found an encapsuled growth, about the size of a small hazel-nut. It had a yellow colour suggestive of fat, but was of rather finer consistence; by no means so firm, however, as the ordinary myoma, giving, on the contrary, a rather soft feel. It was buried in the muscular parenchyma of the organ. The appendages of the uterus were very much matted together, and the organ was adherent to the rectum behind, but free in front. Douglas's space was occupied by a collection of melanoid growths similar to those of the peritonæum generally (see preceding communication), but of larger dimensions, and accordingly soft. The Fallopian tubes were hardly to be made out, buried as they were in multitudes of black growths, and obscured

in their relations by adhesions. On the right side, what was supposed to be the ovary was occupied by two melanoid growths, one as large as a large hazel-nut, and the other a third of that size. It was not certain, however, that this was the ovary, and on the opposite side only apparent traces of the ovary could be made out. [This woman had been 23 years married without any family. The catamenia ceased at the age of 36, four years before her death, after a severe attack of rheumatic fever. For the details of fatal illness, &c., see above.] The microscopic examination of the uterine tumour showed in all respects the usual characters of the fatty growth: large fat cells occurring in closely set aggregates, with some intervening fibrous tissue.

A committee was appointed to report on the heart of this patient, their report to be brought up at a subsequent meeting of the Society.

Dr Wm. Macewen showed a specimen of VESICAL CALCULUS. The patient from whom this specimen was removed complained of pain in the hepatic region. He was over 40 years of age, had a care-worn expression, and bore the appearance of a man who had lived freely. On examining the liver it was found to be normal: but on extending the inquiry into his general state, it was discovered that he sometimes saw a few drops of blood in his urine, and had a feeling of weight at the lower part of abdomen, which he associated with the pain which he felt on his right side. About the other symptoms of stone in the bladder he was very vague. An examination with the sound, however, revealed the presence of a stone of considerable size. His urine was loaded with phosphates. He was advised to have it removed, which he consented to, but preferred lithotomy to lithotripsy—the case of Napoleon seeming to bias him in the direction of the former operation. The stone was accordingly removed by the lateral operation. Two days afterwards, urine was passed at times *per urethram*. Six days after, the urine came away entirely by the ordinary passage, and in twelve days the wound was healed externally. The calculus weighed over eight drachms at first, and consisted of alternate layers of phosphate of lime and uric acid. The nucleus, about the size of a bean, was made up of masses of phosphate of lime loosely thrown together, showing apertures here and there. This was surrounded by a layer of uric acid, forming, as it were, a shell to the other.

Dr Macewen also showed URETHRAL CALCULI, which were removed from the urethra of a boy who presented himself with a greatly distended bladder. On a catheter being used, the urethra was found occluded by a stone. A small pair of forceps was passed down to determine whether the urethra would permit of the extraction of the stone, but seeing that it would not do so, and more especially after finding a second larger stone on the proximal side of the first, an incision was made over the larger stone, and it was removed—the smaller stone being then pushed backward, and extracted by the same opening. The incision through the skin was made so as to

render the cut in the urethra subcutaneous. A catheter was kept in the bladder for some days. In a fortnight afterwards he was dismissed cured. The calculi—one about the size of a cherry, the other about the size of a large bean—were clearly uric acid. The larger one presented a greater number of facets than seemed to be accounted for by the presence of its neighbour; but the bladder was carefully sounded, and no other calculus could be detected.

NINTH MEETING, 23rd March, 1875.

Dr Joseph Coats showed the lungs, liver, spleen, and kidneys, from a case of GENERAL TUBERCULOSIS. He remarked that this case was peculiar, in respect of the large size of the tubercular nodules in all these organs, but especially in the lungs and liver. In the lungs they formed pale tumours, generally about the size of split-peas, but sometimes aggregated so as to resemble cancerous masses. In fact, there were some of these latter which, if seen apart from the rest, would have been set down as cancerous. It was also pointed out that while tubercles in the liver are *usually* so small as to be invisible to the naked eye, these were about half the size of those in the lungs, and thus of not very inconsiderable dimensions. It was stated that the older authors considered that tubercles in the liver were rare in general tuberculosis; but this opinion was based on the naked-eye characters. Microscopic examination reveals their presence in very large numbers; but it is only very exceptionally that they are of such large dimensions as in this case. *Dr Coats* thought this case of interest in illustrating the pathology of tubercle. There were here distinct tumours, many of them of considerable size, and the resemblance to cancer had struck several who glanced at the organs. This seemed to *Dr Coats* to indicate that in many respects tubercle, and especially general tuberculosis, has analogies with cancer, and especially with cancer which has become generalised.

Dr Knox showed, for *Dr Macleod*, the strangulated portion of bowel from a case of OBLIQUE INGUINAL HERNIA. The patient had been a clerk, aged 56 years, and the hernia had existed for 14 or 15 years. The immediate cause of the strangulation seems to have been the removal of his truss before going to bed, combined, perhaps, with the effects of a meal of pea soup containing hard peas. It was three days after strangulation before the patient was brought to the hospital, and for two days he had suffered from vomiting of stercoraceous matters. As the taxis under chloroform had been employed by an experienced surgeon outside the hospital, it was not tried by *Dr Macleod* for more than about two minutes. He then operated. On opening the sac a large piece of omentum was found inside, lying in front of the loop of intestine. The omentum was matted together, and full of varicose veins. The constriction having been relieved, the bowel was returned with some difficulty; the omentum was ligatured, and

the external part removed. Next morning the patient felt easier, but towards evening the vomiting returned and he rapidly sank. On inspection the loop of bowel which had been returned was found quite free in the abdominal cavity, but at the seat of the constriction it appeared as if it had been tied with a string, and ulceration had commenced along the line in several places. Immediately below this constricted piece a knuckle of bowel was found still strangulated at the internal ring; it had dissected its way between the internal and external oblique muscles into the substance of the abdominal parietes. There had thus been a double strangulation of the bowel, only one part of which had been relieved by the operation.

Dr Yellowlee showed a portion of RUPTURED INTESTINE removed from the body of a patient, æt. 36, the subject of general paralysis, but in good general health, who fell while running, and a man who was running after him, and was at the moment close behind, falling heavily over or upon him. Vomiting occurred very soon after, and was followed by great prostration and frequent hiccough. The patient declared throughout the illness that he had no pain, but the prostration increased, general peritonitis was developed, and he died 77 hours after the accident. *Post-mortem examination* revealed a very small rupture of the intestine, scarcely sufficient to admit a quill. The opening was situated about 4 feet 6 inches below the pylorus, and on the part of the bowel opposite to its peritoneal attachment. The intestine seemed quite healthy, nor was any foreign body found in it, by which such an injury might have been caused.

Dr William Macewen showed a patient with MULTIPLE ANEURISMS. This man presented himself at the Royal Infirmary Surgical Dispensary, with an aneurism of the femoral artery, having the following history:—The patient was 56 years of age. Three years ago, while working on board ship in the West Indies, he over-exerted himself, felt feverish, and was sent ashore to one of the hospitals, where he was treated for "local fever." After his return to his ship he found his right leg swollen, and on examining it closely he found a pulsating tumour of small size in the femoral region. From that time it gradually increased in size, but latterly it has increased more rapidly. At first it was lobulated, a band dividing a small upper portion from the bulk of the tumour below. Some superficial inflammation took place, after which this constriction gave way, and the tumour became uniform in shape. It was situated at the upper part of the femoral, implicating also the external iliac for about an inch above the normal line of Poupart's ligament: this latter structure, in a somewhat altered form, being found above and more to the front of its usual situation. The aneurism took a circular form, and measured five inches, both longitudinally and transversely. In several places its walls were very thin. On the left femoral another aneurism, about the size of a large walnut, was situated about two inches below Poupart's ligament. Accompanying the second sound of the heart, there was a murmur, which was prolonged over the great

vessels, and especially towards the right side. There was an area of dullness on percussion over the right side of sternum, extending for fully two inches further towards the right side, between the second, third, and fourth ribs.

Dr George Buchanan showed a case of RUPTURE of the SMALL INTESTINE without any external mark of violence. The patient, who was admitted to the Western Infirmary shortly after the accident, had been drawn in contact with a revolving shaft by her clothes becoming entangled in machinery. She was wheeled round, and her head dashed against a wall. She, however, sustained no serious apparent injury, except a contusion of the scalp. No peritoneal or other symptoms showed themselves at first, the only noticeable phenomenon being a marked and increasing smallness of the pulse. She had some vomiting about twelve hours after admission, and she gradually sunk exhausted twenty-three hours after the accident, having spoken quite sensibly and calmly about a quarter of an hour before death. The rupture, found on *post-mortem* examination, was about an inch long. No faecal matter was found in the abdominal cavity, but very extensive peritonitis and recent lymph effusion.

Dr George Buchanan also showed two CALCULI removed six weeks previously from a patient in the Western Infirmary. The patient had been operated on with the rectangular staff, and had made a good recovery. The stones were curiously faceted, on each there being a saddle-shaped depression on which it had moved on the other. One was two inches long by one inch broad, the other one and a quarter inches long by about one inch broad. They both consisted entirely of urate of ammonia. On section one was found to be exactly a small duplicate of the other. Each had, instead of a nucleus, a hollow cavity containing a shrivelled clot of blood. In one the cavity containing the clot was about the bulk of a garden bean, and the other of a dried horse bean. The urate of ammonia was ranged in distinct layers, and in many places there were hollow intervals between the layers wide enough to admit the point of a pen. There was a history of hæmaturia three years before the patient came under observation.

The *Secretary* showed, for *Dr Macleod*, two specimens of FRACTURED SPINE, the fracture being in the cervical region in one, and in the dorsal region in the other. The first was caused by the man (a very strong Englishman, æt. 34) having been forcibly bent backwards over a fence by another; he became suddenly paralysed, and was then thrown down, and was left in a wet ditch. He lived for twenty-one days, and then died of exhaustion. During all the time he survived he was virtually dead, all except his head and neck and the upper portion of his arms; he had neither sensation nor motion in his body or lower limbs. He suffered much from priapism and bed sores. The cord was found directly pressed on by the fractured bone; it was softened and disorganised. The other

patient was a man, aged 21, who fell down stairs when drunk. he was entirely paralysed as regards sensation and motion from the moment of the accident, the paralysis extending exactly up to the crest of the ilium. The splanchnic nerves were also involved, so that much disturbance of digestion was present; in fact, it was the exhaustion produced by vomiting, &c., which killed him. He died ten days after the accident. There was no irregularity, discolouration, or swelling in the dorsal region behind to indicate the seat of the fracture.

Dr Joseph Coats showed a heart with CHRONIC ENDOCARDITIS localised on the wall of the left ventricle. It was pointed out that endocarditis, both acute and chronic, usually attacks the valvular structures. In this case, however, the endocardium on the left side of the wall of the ventricle was thickened over an area of about $1\frac{1}{2}$ square inches. The muscular trabeculae were in this region converted into fibrous trabeculae, and the ventricle, though generally dilated, was specially so in this region. Between and behind these altered trabeculae there were five or six globular vegetations, which peeped out from the recesses. One of these which had been cut across was as large as a hazel-nut, and had a pale granular section, with just a trace of softening in the centre.

REPORT ON "MAMMARY CYST WITH INTRA-CYSTIC GROWTHS," BY DES REID, COATS, AND CAMERON.—The cystic tumour shown by Dr Cameron at the last meeting of the Society was removed by him on the same day (March 9th), from the left mamma of a patient in the Royal Infirmary, aged 43, and unmarried. It was situated to the outside of the nipple, and a great part of it was underneath the areola. It was tense and hard, but distinctly fluctuant. The skin was freely moveable over it, except at one point where a cicatrix existed. At this spot, it had been on one occasion evacuated by incision by a medical man. The nipple was extremely retracted. The disease had existed for six years, and was not painful. On March 6th, Dr Cameron drew off from the cyst an ounce of very bloody fluid, by means of a canula and trocar; and the cyst having collapsed, some small round lumps could be felt at a situation corresponding to its upper end. The nipple, formerly retracted, was now found to have resumed its normal position. In three days it had again refilled, and was removed. On being incised it was found to be again filled with bloody fluid. It measured $2\frac{1}{2}$ inches in length, by $1\frac{1}{2}$ inches in breadth. There were observed, on its inner surface, three intra-cystic growths, pink in colour, and apparently highly vascular, the largest being about the size of a bean. The wall of the cyst, on examination, was found to be about two lines in thickness, and composed of fibrous tissue, in layers arranged concentrically with the surface, which was smooth and shining internally. These layers appeared to be condensed connective tissue, with traces of nuclei still visible. At an angle in the upper extremity of the cyst, there were found projecting into the cavity three small warty excrescences, which, under the

microscope, were seen to consist mainly of elongated, filiform papillæ, covered with the usual epithelial layers. These growths had all the appearance of having been the source of the blood contained in the cyst.

TENTH MEETING, April 13, 1875.

Dr Hunter, in the absence of *Dr Strethill Wright*, exhibited a heart in which there was extensive CALCAREOUS DEPOSIT on the valves. The patient had recently been suffering from severe asthma and bronchitis, with extensive dropsy of the lower extremities and effusion into the peritoneum. The deposit on the aortic valves was so great that the tip of the little finger could with difficulty be passed through the opening.

Dr Hunter also showed a preparation from a patient who had been under treatment for STRICTURE OF THE URETHRA. According to the patient's own account he underwent, some years ago, the operation of forcible dilatation, and experienced great relief for about three weeks thereafter; the stricture, however, returned with increased severity, so that at intervals he was entirely unable to pass water by the urethra. He died from acute pericarditis, and at the autopsy the walls of the bladder were found greatly hypertrophied, the urethra was at one point greatly diminished in calibre, and beside the stricture was an artificial pouch into which the catheter had passed whenever the instrument was used during life. It had been noted on these occasions that although the catheter could not be passed into the bladder, urine always came away by the side of the instrument, and an examination of the specimen showed that any pressure on the pouch would produce stretching of the walls of the adjoining constricted portion, and would thus allow the urine to escape.

Dr H. C. Cameron showed a FATTY TUMOUR recently removed; a portion of it being of osseous consistence it was referred to *Dr Coats* to report if it contained any true bone structure.

Dr Robertson also showed two insane patients with HÆMATOMA AURIS. A full account of these cases will be found in *Dr Robertson's* article on this subject in the present number of the *Journal* (page 308).

Dr T. S. Mighan showed a patient with well marked RETINITIS ALBUMINOSA, and detailed the following clinical history:—

M. A., aged 22, was admitted a patient of the Eye Infirmary, Charlotte Street, on the 22nd Dec., 1874, complaining of dimness of vision, which was first noticed six weeks before; it was preceded by severe headache and vomiting. She never noticed any swelling of the feet or legs. Complaints of pain on left side of chest. Cardiac impulse much increased, and of a heaving character. Urine acid, pale yellow; sp. gr. 1010; contains abundance of albumen; under the microscopic granular tube casts. On admission the pupils were dilated and sluggish in action. She could

read No. 19 Jaeger with right, and 20 with left eye. *Ophthalmoscopic Examination*.—Media transparent, refraction hypermetropic, papilla congested and ill defined. Arteries diminished both in calibre and number, some of the branches being accompanied by white streaks. Veins dilated and tortuous. Here and there the vessels disappeared, being covered by whitish exudation. In the neighbourhood of macula there was a large yellowish-white granular patch, with shining spots interspersed: numerous white spots were scattered over fundus, especially in the course of the vessels, and there were some few spots of hæmorrhagic effusion. Vision greatly improved during the next two months, but on the 22nd of February it became necessary to visit her at her own house, as she was too ill to come to the Infirmary. At that date she stated that, on the 20th, intense headache with slight delirium came on, followed by vomiting, and that on the next day she discovered that the sight was gone. At the time of the visit she was, however, able to distinguish light from darkness. There was circumorbital œdema, with congestion and œdema of conjunctivæ, pupils were dilated and fixed, urinous odour from skin, urine diminished in quantity and less albuminous. *Ophthalmoscopic examination* revealed œdema also of the retina, as evidenced by the refraction which was now highly hypermetropic, the fundus being easily seen at twelve inches distance, a large white mound encircled the papillæ, and at the circumference of this were a few hæmorrhagic spots. On the 11th March, she could see No. 18 with right and make out letters in No. 12 with left; œdema of fundus was subsiding, the urine was more abundant in quantity, and contained more albumen. On April 8th, the report was as follows:—Sees No. 6 with right, and No. 4 with left. Quantity of urine measured for one week amounted to 36 ounces per day—still much albumen, and containing a few granular tube casts. *Ophthalmoscopic Examination*.—(Edema of the retina has now subsided considerably, otherwise the appearance of the fundus is unchanged, the hæmorrhagic spots have become absorbed, and the whole spots scattered over fundus have increased, and in some places coalesced, forming white patches. Dr Pintayson examined the patient on March 24th, and reported—Very marked signs of hypertrophy of heart, chiefly of left ventricle. Impulse very much diffused, and of heaving character. Apex beat displaced much to left. Cardiac dulness unduly extends both to right and left of normal limits. Deepened tone of second sound at upper sternum and aortic cartilage, with tactile sense of snap. No bruit. Says no hæmoptysis.

The case is interesting, in so far that it presents well marked appearance of the retina met with in Bright's Disease, showing fatty degeneration of the cellular tissue of the retina, as well as sclerosis of the nerve fibres and blood vessels; and the fact that œdema of the feet and legs has never occurred. It may be worthy of note also, that while the urine was abundant in quantity the sight improved; when diminished, the retinal affection got worse, thus showing that the disease of the retina may be influenced by the retention of urea in the system in such cases.

Dr David Foulis demonstrated the use of his arrangement for AUTO-LARYNGOSCOPY, as described by him in the January number of this *Journal*.

Dr A. Robertson showed the bladder and prostate, ureter, and kidney from a man, age 74, who had died in the Town's Hospital two days previously with symptoms of blood-poisoning. The prostate was much enlarged, but its central portion internally was irregularly excavated and in a sloughy state. The wall of the bladder was thickened, and the mucous membrane of the fundus and lower sides was of a dusky red colour, and superficially ulcerated at several points. The kidney had undergone fatty degeneration to a slight extent; the ureter was healthy. It appeared from the history that the patient had enjoyed good health, except a little slowness in passing water, till the day of his admission into the hospital. Complete RETENTION OF URINE had then set in somewhat suddenly. He had gone to a practitioner who had endeavoured to pass a catheter, but only blood had come away. Immediately after his admission a prostatic instrument was introduced without difficulty and the urine removed. He survived a fortnight, and during that period the catheter was used twice or thrice daily.

Dr A. Robertson also showed the TUBERCULOUS LUNGS, SPLEEN, AND HEART of a child, age 18 months. The tubercle in the miliary form was very equally disseminated through both lungs from apex to base; there were a few superficial deposits in the spleen, and two specks on the surface of the heart at the base of the ventricles. Near the cardiac spots there was a film of false membrane indicative of slight pericarditis. The brain and its membranes had been carefully examined, but no tubercle was found.

Dr Joseph Coats showed, for *Dr Chapman*, of Hereford, a large TUMOUR OF THE UTERUS which had undergone calcification. The tumour was as large as the fist, and felt like bone covered with a thin cartilaginous layer. Its surface was rough, and there were several deep depressions. A section made with the saw showed that the calcareous material was present in every region of the growth, but was more abundant towards the surface. On the surface itself there was a continuous layer of soft tissue, and the spaces left by the calcareous portions internally were also filled by a tissue, whose consistence, however, was considerably softer than the external layer, which was almost cartilaginous to the feel. The microscopic structure of the soft tissue in both regions was almost identical, being that of the myoma or fibroma of the uterus. Sections were shown in which it could be seen that the tissue was made up of cells closely set, and containing rod-shaped nuclei. The calcareous portion presented nothing of the structure of true bone, but simply a homogeneous appearance with a crystalline aspect. The addition of a dilute acid dissolved the lime-salt with very abundant evolution of gas, thus showing that the carbonate of lime was present in preponderating amount. It was stated that the tumour had been found on *post-mortem* examination, and no symptoms were known to exist during life.

Dr Gairdner showed a temperature chart, with appended notes, which exhibited very clearly the gradual defervescence of a case of ENTERIC FEVER, coinciding with disappearance of the eruption, and of all the local symptoms. Just when the temperatures had become normal, a new disturbance occurred, which, on careful examination, proved to be a suppuration of the left ear; this continued, with irregularly oscillating temperatures, deafness, and some degree of local pain and swelling over the mastoid process, until an incision was made extending down to, and perhaps into, the bone, and dressed antiseptically: after which the discharge through the ear dried up, the hearing partially returned, and the temperature became normal.

ELEVENTH MEETING, MAY 11th, 1875.

Dr Foulis showed a part of a skull in which an old UNITED FRACTURE existed. The fracture passed from above the left external auditory meatus across the squamous suture, and ended about an inch from the apex of the lambdoidal suture. It was united over nearly the whole of its extent, leaving a mere groove to mark its seat, but near its commencement an oval gap was left which was filled with fibrous tissue. Between the skull and the dura mater, at and near the seat of fracture, there existed a pale fawn-coloured laminated layer, apparently an old clot. This had eroded the bone over it slightly. Under the microscope it showed an ill-defined fibrous structure, with small masses of pigment imbedded.

Dr Foulis also showed a specimen of ATHEROMA of the arteries at the base of the brain, in a case of hæmorrhage into the ventricles. The exact seat of the ruptured vessel was not found, after a careful search, and *Dr Foulis* was inclined to ascribe the bleeding to bursting of smaller vessels in the velum interpositum. The heart of the patient was greatly hypertrophied, especially the left ventricle, and weighed 18 ozs.

Dr Strehill Wright presented a patient recovered from SYNOVITIS OF THE ANKLE JOINT. The interest of the case depended upon the length of time the patient had suffered from the disease, during the whole of which time the symptoms had not abated, but steadily increased in severity; the fact that the ordinary remedial means had been tried, and had not been followed by recovery; that under a special plan of treatment, combined with the use of the antiseptic method, the joint was restored to its normal state. The history was as follows:—

Mary M.M.—Six years ago, she received a kick on the shin about three inches above the right ankle, shortly after which the ankle began to swell, and became very painful. For three years she was very lame, and suffered great pain; at the end of this time she entered the Royal Infirmary. She then suffered some darting pains, originating in the ankle. They even came at night and prevented her from sleeping. After a residence of six months she left little improved. In June, 1873, she was again obliged to go into hospital, where she at this time remained five months; the state of

the ankle-joint was then such that amputation was recommended. She would not submit to operation, and left the house in January 1874. She was admitted a patient to the Barony Hospital in the September following. On admission, the affected ankle was much swollen and very painful, especially at night. Five sinuses were present; these communicated with one another; and on passing a probe, bare bone was felt. The joint was not opened.

Treatment.—After admission the ankle was incised and the sinuses laid open: the ankle was dressed antiseptically, and under the carbolic acid spray it underwent no improvement. About December 16th, 1874, another method of treatment was adopted. A syringe was procured, furnished with a long sharp point of the calibre of a stout knitting-needle; with this instrument the swollen and inflamed tissues of the joint were pierced, and injected in all directions with a carbolic solution (1-40): the joint was not pierced. A poultice of linseed meal carbolised was applied as dressing next the joint, covered with antiseptic gauze in eight folds, and the whole secured with a cotton bandage. The injecting and dressing were constantly done under carbolic spray. This process was repeated at first daily, then at intervals of several days, and was continued for four months. Shortly after commencing this treatment the leg was placed in a box-pasteboard splint, moulded to its shape; in this it was kept for two months. Under this treatment the diseased ankle made marked and steady progress towards recovery, the pain disappeared, the swelling decreased—the sinuses closed. Six weeks ago, after a sharp injecting, a erysipelatous inflammation attacked the injured ankle: the use of the antiseptic dressing and spray were then discontinued, but a simple water dressing sufficed to heal the now merely superficial openings. The patient states that soon after the injecting treatment was commenced, the severe pain in the joint, from which she had long suffered, ceased and did not return. The patient has now no pain; she can use the foot, and practice the motion of the joint. The joint seems quite restored to its normal condition.

Dr Wright also gave particulars of a case OF SYNOVITIS OF THE WRIST-JOINT treated in the same way, with a like successful result, and made the following comments:—

“It seems that recovery in these instances followed the treatment described, and also that this injecting treatment was instrumental in promoting that recovery—in enabling these joints so to recover. Both diseased joints had become worse under other methods, and at once improved under this, in itself painful, process. Queries (1). What is the mechanism, so to speak, of the curative action of a carbolic acid solution used as in these cases. (2) Was not the subcutaneous injection used with needless frequency and severity—would not the same end have been obtained with a more sparing use of the same means?”

Dr Reid showed two cases of SYMPATHETIC OPHTHALMIA illustrating the

extreme forms of the disease met with in practice. The first was a young man, aged 20, who was admitted to the Eye Infirmary, February 15th, 1875, with a wound in left cornea, passing from the junction of the cornea with sclerotic at its lower and inner margin, upwards and inwards for about two lines. The wound was occupied by prolapsed iris; this was snipped and atropine solution prescribed. Slight inflammatory symptoms persisted for about three weeks, and gradually passed off, leaving, however, a certain irritability. Patient being anxious to return to his employment, permission was granted, but a fortnight after this he returned with sclerotic injection of both eyes; the lower margin of right cornea hazy; the pupil normal in size, but adherent to lens (complete posterior synechia); this did not yield to atropine solution of full strength, but the left pupil dilated readily. Calomel and opium were prescribed at night, and atropine continued, and in addition, iodide of potassium 5 grs. three times a day. Symptoms of well-marked serous iritis supervened, both corneae being studded with minute brownish dots. The inflammatory symptoms, however, gradually subsided, and the right pupil began to yield. When shown to the Society, the pupil of both eyes dilated fully, opacity and dotting of corneae had cleared off as well as the symptoms of inflammation. The eyes, however, were still sensitive to light or irritation. The sight was not perceptibly affected in either eye throughout the course of the disease. The details of the other case were as follows:—A boy, *æt.* 14, admitted to the Eye Infirmary, December 9th, 1874, with a severe injury, from a fragment of iron, of right cornea, extending from its centre vertically upwards for about two lines into the sclerotic, the eyeball being partially collapsed. He was at once put to bed, extract of belladonna and bandage applied, the inflammation, which was not great at first, gradually declined, and he was allowed to go home in three or four weeks, with instructions to avoid using his eyes, and to carry on the treatment. In a fortnight he returned with symptoms of superficial inflammation (hyperemia) of both eyes. The vision of left eye being good, pupil acting readily to light, and there being no ciliary pain on pressure in the injured eye, it was hoped that the symptoms were superficial, and might pass off, but it was explained that enucleation might be necessary. He was put to bed, and iodide of potassium in small doses administered. Eyes remained in much the same condition, one day better another worse, the pupil of left still acting freely; but as the patient began to complain of occasional dimness of vision, enucleation was performed on Feb. 17th, 1875. The operation was easily done, but was followed by considerable hæmorrhage, and violent deep-seated pain in the cavity of orbit; next day the pain had abated, and the hæmorrhage ceased. The pupil, which was formerly dilated, became contracted in spite of 1 grs. solution of atropine, and at ciliary attachment of iris a deep livid ring appeared. Small doses of calomel and opium were prescribed, but on third day the vision declined, so that he was barely able to distinguish fingers. The dose of iodide of potassium was increased, but the disease progressed; the pupil became more contracted, the iris

œdematous, and, traversed by a considerable number of highly congested vessels giving it a pinkish appearance, it bulged forwards, but there was no iridonecrosis; vision was now extinct. The stump of the enucleated eye remained irritable. The enucleated ball placed in chromic acid for a month, was laid open by horizontal section from before backwards, and the appearances were as follows:—The retina, as is usual in such cases, was found completely separated from choroid, with the exception to one point to the outside of the macula and near the entrance of ciliary nerves and vessels. The separated retina was pressed forward, and lay in folds against the zonula of Zinn and partially dissolved lens, which remained in situ, sending two cord-like prolongations, to the optic nerve entrance and the point of adhesion to the choroid already mentioned. The choroid on each side of the point of adhesion was considerably hypertrophied; the sclerotic at this point also projected inwards, with a corresponding depression at its outer surface. In the depression of the surface a number of hypertrophied blood vessels were observed. The radial fibres of the ciliary body were detached from the sclerotic towards the equator of the lens, as is usual in inflammation of ciliary body. The anterior chamber was occupied by hypertrophied iris. The adhesion of the retina to the choroid and the conditions of the sclerotic seemed to indicate that an injury had been inflicted in this region by the fragment of iron, which possibly had penetrated the ball at this point, although there was no distinct cicatrix. A search being instituted in the stump (six weeks after operation), it was found the conjunctiva had not cicatrized, and fungous granulation occupied the centre. This having been removed, a probe was passed in various directions, but no foreign body was found, neither was any found in the eye removed.

[Dr Reid has recently made a more careful examination of the enucleated eyeball, and has discovered a thin fragment of iron about half-an-inch in length and three-sixteenths in breadth, imbedded deeply in the lower hemisphere, close to the lens; one of its extremities pressing on the inferior part of the ciliary processes. From this point backwards the retina adheres to the choroid, giving the section the appearance already referred to; this adhesion does not extend to the upper hemisphere of the eyeball. The position of the foreign body accounts for the adhesion of the retina and hypertrophy of the choroid, either by the extension of the inflammation backwards from the ciliary processes, or by direct injury to the parts at the time of the accident, by the fall of the foreign body to the lower part of the eye.]

Dr Reid remarked that in the first case, although the sympathetic affection involved the iris, the vision of both eyes being good and the disease being much less dangerous than other forms of sympathetic inflammation it was resolved to give the patient a chance without operation, and although, up to the present, the disease has been amenable to treatment, and all traces of inflammation nearly passed away, the case still requires to be watched in case of a recurrence. In the second case, the vision being but slightly affected, and there being no evidence of iritis, the usual beneficial results from enucleation seemed likely, but very manifest aggravation of symptoms after enucleation pointed to some diseased condition

of the ciliary blood vessels, or possibly some affection of the ciliary nerves at their entrance in the stump, as the parts in the injured eye seemed quiescent. He thought that sympathetic disease might thus be due to disease of the blood vessels, or to irritation of the ciliary nerves in other parts of their course, and not merely to their irritation in the ciliary body, as usually supposed. The conclusion to be drawn from this case was, that in all cases of injury of the eye causing, from their nature, complete destruction of vision, enucleation should be insisted on.

Dr Reid also showed a patient with DIABETIC CATARACT in both eyes, and read the following history:—R. M.L., a brakesman, æt. 22, was admitted to the Glasgow Eye Infirmary, 16th April, 1875, with fully formed cataract in both eyes. Dimness of vision began about a fortnight before admission, and increased to its present state in three days. His appetite and thirst were excessive, and he passed a large quantity of pale urine—specific gravity 1038—giving with Trommer's test for sugar an abundant brick-red deposit. Impairment of health commenced in February or March, 1874, with diarrhoea and vomiting, followed by excessive appetite, thirst, and loss of strength. After six months' continuance of the symptoms, he noticed œdema of the feet, especially at nights, but this had passed off about a week before presenting himself at the Eye Infirmary. Treatment on admission—Fluids were restricted, sugar for meals stopped, and patient to have Tinct. Mur. Ferri. gtt. xx., and Pulv. Doveri. grs. x., at night. Four days after admission the Tinct. Mur. Ferri. was changed for the Tinct. Cannab. Indic. gtt. x., 3 times a day. On the 30th April, he was supplied with diabetic biscuits and rusks. Under this treatment the patient improved, his thirst diminished, and the quantity of urine passed became only half of what it formerly was. His appetite underwent marked improvement, especially since taking the biscuits, so that he could wait with comfort for his meals, while previously he had a craving for food an hour after each.

Dr Reid said that this form of cataract was frequently found in the milder forms of diabetes in young persons, as well as occurring in the advanced stages in the more severe. In the former cases we are justified in operating, if the health be good, as is proposed in this case.

Dr Hector C. Cameron presented a patient with PARALYSIS OF ACCOMMODATION, following upon diphtheria. The patient, a boy of 11 years of age, was attacked with diphtheria on 13th February last. The disease ran a favourable course throughout, and no symptoms of paralysis showed themselves till a month after the doctor in attendance (Dr Thomas Barr) had ceased to visit. Patient began to notice a defect of vision, however, as soon as he returned to school after his illness, being unable to read his lesson books. He said that things far off were seen clearly, while near objects were either hazy or indistinguishable. There was also slight paralysis of the muscles of deglutition, and of those of the soft palate, fluids being frequently regurgitated through the nose. It was stated that during an attack of whooping cough he

had had internal squint. He was treated with syrup of the iodide of iron and liq. strychniæ, and vision gradually improved.

Dr Renfrew referred to a case of the same nature which had been recently under his care. The patient was a clergyman, whose children had been for some weeks ill with measles, two of them having also a diphtheritic exudation on the tonsils, and being very weak and depressed, with sordes on the lips and teeth. On May 3rd the clergyman himself took ill with hoarseness and sore throat; on the 4th he felt his sight weak, and by the 7th could barely distinguish near objects. On the following day he saw *Dr Reid*, who diagnosed paralysis of the ciliary muscle, and ordered him to get a pair of 18 or 20 in. convex glasses. He is now very much improved, his sight being almost completely restored.

Dr Reid said that the case of the clergyman was one of much interest, from the early date at which the vision became affected, and the rapidity with which changes occurred in the power of accommodation. With regard to the boy, he enquired if he were hypermetropic, as he had found this diphtheritic affection chiefly occurring in those who were so; and the history of squint, during the illness from whooping cough, pointed in the same direction. The clergyman referred to was not hypermetropic.

The *Secretary* presented, for *Mr W. J. Fleming*, a cheap hot GAS STAGE, constructed on the same principle as Stricker's, but having no top plate, tubes for fluid, nor thermometer. It can be procured for about five shillings, and serves all ordinary purposes.

The *Secretary* also showed, for *Mr Fleming*, an instrument to facilitate CUTTING SECTIONS of tissues hardened by freezing. It consisted of a Stirling's section cutter, surrounded by a chamber, through which a current of weak spirit was caused to flow, the spirit having previously been reduced to a very low temperature by passing through a worm immersed in a freezing mixture.

Dr Cameron showed a DAMSON STONE passed from the bladder by a male patient, 43 years of age. His first symptoms were frequency of micturition, with a little pain in the perineum, and these began about 12 months ago. About November last he had, for two or three days, violent pains just below the umbilicus, with vomiting, and one or two rigors. On the cessation of this attack he began to pass gas *per urethram*, and his urine became very turbid, but not distinctly feculent in odour. In a week he was again able to follow his business. Till about two and a-half months ago he continued at business, gaining flesh and feeling well, but all along passing gas *per urethram*, and often a little blood on the conclusion of micturition; and soon he began also to pass fluid feces *per urethram*. This resembled meconium in appearance. At this point of the case, *Dr Cameron* saw him with *Dr Suttie*, by whom the above particulars were supplied. On sounding the bladder nothing was elicited, but on giving a sudden sharp stroke above the pubes, succussion sound was very distinctly made out in the bladder; the percussion note being also tympanitic. The rectum was natural in all respects, and although filled with rather hard feces, thin feces were coming *per urethram*.

It was evident that the connection was not with the rectum. A fortnight after this examination he passed, *per urethram*, the fruit stone exhibited. It had a slight crystalline deposit on it. In order to allow the opening in the bowel to heal up, he had been fed, for some weeks, entirely by enemata; *faeces* had ceased coming *per urethram*, and for some days at a time no *flatus* even had escaped.

Dr Joseph Coats showed a specimen of OBSTRUCTION OF THE INTESTINE. He pointed out that a diverticulum which proceeded from the ileum three or four feet above the valve, had become adherent by its apex to the mesentery of the ascending colon. Beneath the bridge thus formed, several loops of small intestine had passed in rather a complicated way, and one small portion which had passed twice under the bridge showed the dark red colour and thickened appearance of complete strangulation. It was remarked that the diverticulum was three or four inches in length, and had a somewhat blunt extremity, but that from this extremity there proceeded a fibrous band an inch or more in length, which formed the medium of attachment of the diverticulum. The preparation was removed from a boy about 9 years of age, who had died with the usual symptoms of internal obstruction of the intestine.

Dr Joseph Coats reported on the CALCAREOUS MASS in *Dr Cameron's* fatty tumour, that it presented none of the histological characters of true bone, but was composed of a homogeneous substance, having a somewhat crystalline appearance. The addition of an acid caused very abundant evolution of gas (CO^2) and solution of the calcareous salt, but no definite organised basis was left behind.

THE GLASGOW AND WEST OF SCOTLAND MEDICAL ASSOCIATION—1875.

President—Professor ALLEN THOMSON, M.D., F.R.S.

Vice-Presidents—Dr EBEN. WATSON and Dr SCOTT ORR.

Treasurer—Dr JOHN WILSON, 2 Eton Gardens, Hillhead.

Editorial Secretary—Mr HENRY E. CLARK, 9 Elmbank Street.

General Business Secretary—Dr GAVIN P. TENNENT, 120 Bath Street.

General Business Committee.

PRESIDENT,
VICE-PRESIDENTS,
TREASURER, and
SECRETARIES,
Dr JOSEPH COATS.
Dr ALEXANDER ROBERTSON.

} *Ex officio.*

Dr GAIRDNER.
Dr JOHN B. COWAN.
Dr A. WOOD SMITH.
Dr ROBERT PERRY.
Dr J. B. RUSSELL.
Dr JAMES FINLAYSON.

MEMBERS.

ADAM, CHARLES, Esq., M.D., Coat-
bridge
ADAMS, Alex. Maxwell, Esq., Sur-
geon, Lanark

Aikman, J. S., Esq., M.D., Guernsey
Aitken, John, Esq., M.D., 178 Govan
Road, Govan
Alexander, John, Esq., M.D., Wick

- Alexander, Wm., Esq., M.D., Dundonald, by Kilmarnock
 Allan, George R., Esq., M.B., 4 Wallworth Terrace, Kent Road
 Allan, James W., Esq., M.B., Bel-
 fort Hospital, Fort William
 Anderson, T. McCall, Esq. M.D.,
 14 Woodside Crescent, Glasgow
 Arbuckle, John H., Esq., M.D.,
 Thorne, Doncaster
 Arnott, James, Esq. M.D., Euro-
 pean Hospital, Bombay
 Arrol, Charles, Esq., M.B., 12
 Bankstown, Sheerness
- BARR, THOMAS, Esq., M.D., 66 Rose
 Street, Glasgow
 Barras, James, Esq., M.D., Govan
 Bell, Robert, Esq., M.D., 29 Lyne-
 doch Street, Glasgow
 Billing, James P., Esq., Surgeon,
 Hailsham, Sussex
 Blair, William, Esq., M.D., Abbey
 Green, Jedburgh
 Borland, John, Esq., M.D., Kilmar-
 nock
 Brown, George, Esq., M.D., Col-
 chester, Essex
 Brown, Hugh, Esq., M.D., Strathaven
 Brown, Thomas, Esq., Surgeon,
 High Street, Dunblane
 Brunton, John, Esq., M.D., 21
 Euston Road, London, N.
 Buchanan, Andrew, Esq., M.D., 4
 Athole Place, Bath St., Glasgow
 Buchanan, A., Esq., M.D., Morro
 Velho, Brazil
 Buchanan, A. M., Esq., M.D., 149
 St George's Road, Glasgow
 Buchanan, George, Esq., M.D., 193
 Bath Street, Glasgow
 Buchanan, Thos., Esq., M.B., Belvi-
 dere Hospital, Glasgow
 Burns, John, Esq., Surgeon, 211 St
 Vincent Street, Glasgow
- CAMERON, H. C., Esq., M.D., 291
 Bath Street, Glasgow
 Cameron, Murdoch, Esq., M.D., 130
 Parliamentary Road, Glasgow
 Campbell, Alex., B.A., L.F.P.S.G.,
 Borve, Portree, Skye
 Carmichael, Neil, Esq., M.D., 81
 South Portland Street, Glasgow
 Caskie, James, Esq., Surgeon, Largs
 Caskie, John B., Esq., M.D., 89
 Goswell Road, London, E.C.
 Cassells, J. P., Esq., M.D., 2 Newton
 Terrace, Glasgow
 Chalmers, James, Esq., M.D., 17
 South Apsley Place, Glasgow
 Chapman, — Esq., Cambuslang
 Chapman, Thomas Algernon, Esq.,
 M.D., County Asylum, Hereford
 Charteris, M., Esq., M.D., 8 Blyths-
 wood Square
 Clark, Henry E., Esq., Surgeon, 9
 Elmbank Street, Glasgow
 Coats, John, Esq., M.D., 121 Bath
 Street, Glasgow
 Coats, Joseph, Esq., M.D., 33
 Elmbank Street, Glasgow
 Corbett, Robert, Esq., M.D., Barr-
 head
 Cowan, John B., Esq., M.D., 159
 Bath Street, Glasgow
 Cowan, Robert, Esq., M.D., 9 Seton
 Terrace, Dennistoun, Glasgow
 Cullen, John F., Esq., M.D., Rowan-
 lea, Alexandria
 Cumming, J. Simpson, Esq., M.D.,
 310 St Vincent Street, Glasgow
 Cunningham, Hugh, Esq., Surgeon,
 Dumfries
 Currie, John, Esq., M.D., Parkend,
 Lydney, Gloucestershire
 Currie, Ronald, Esq., M.D., Wemyss
 Bay
- DALZIEL, JAMES, Esq., Surgeon,
 Green Street, South Shields
 Davies, P. Lloyd, Esq., Surgeon,
 Bryncoch House, Abergele, Den-
 bighshire
 Dewar, Donald, Esq., M.D., 27
 Elmbank Crescent, Glasgow
 Dick, James, Esq., M.D., Harring-
 ton, Cumberland
 Dickson, Professor Alexander, M.D.,
 The University, Glasgow
 Dobbie, James, Esq., M.D., 2 Kelvin
 Terrace, Glasgow
 Donald, James T., Esq., M.D.,
 Paisley
 Donaldson, James, Esq., M.D., 6
 Granby Terrace, Glasgow
 Dougal, Daniel, Esq., M.D., Old
 Manse, Strathaven.
 Dougall, John, Esq., M.D., 339
 Paisley Road, Glasgow

- Dougan, Wm., Esq., M.D., Argyle District Asylum, Lochgilphead
- Dudley, Wm. H., Esq., Knowle, Birmingham
- Duncan, Ebenezer, Esq., M.D., 4 Royal Crescent, Crosshill
- Dunlop, James, Esq., M.D., 18 Carlton Place, Glasgow
- EASBY, WILLIAM, Esq., Surgeon, Darlington
- Easton, David, Esq., M.D., Stranraer
- Evans, Thomas Coward, Esq., Surgeon, 1 Rose Vale, Great Homer Street, Liverpool
- FARQUHARSON, JAMES, Esq., M.D., Coatbridge
- Fenwick, William, Esq., M.D., 9 Moray Place, Strathbungo
- Fergus, Andrew, Esq., M.D., 41 Elmbank Street, Glasgow
- Fergus, James, Esq., Surgeon, East Kilbride
- Fergusson, Alex., Esq., Surgeon, Peebles
- Finlay, James, Esq., M.D., Rockbank, Helensburgh
- Finlayson, James, Esq., M.D., 351 Bath Street, Glasgow
- Fleming, J. G., Esq., M.D., 155 Bath Street, Glasgow
- Fleming, Joseph M., Esq., M.D., Khandwa, India
- Forrest, Robert W., Esq., M.D., 45 Abbotsford Place, Glasgow
- Fraser, Donald, Esq., M.D., Paisley
- Frazer, John, Esq., M.D., Chapel Ash, Wolverhampton
- Freer, Fred. A., Esq., Surgeon, Govan
- GAIRDNER, W. T., Esq., M.D., 225 St Vincent Street, Glasgow
- Games, John, Esq., M.D., 19 Earle Street, Liverpool
- Gardner, John, Esq., M.D., 1 Lendal Terrace, Paisley Road, Glasgow
- Gemmel, James, Esq., M.D., Dunoon
- Gemmell, Samson, Esq., M.B., City of Glasgow Fever Hospital, Parliamentary Road, Glasgow
- Gibb, Gabriel, Esq., M.D., Helensburgh
- Gibson, William, Esq., M.D., Kirkland, Campbeltown
- Gilland, Robert B., Esq., M.D., County Asylum, Moultsford, Wallingford, Berks
- Gillies, Hugh, Esq., Surgeon, Easdale, Oban
- Gilmour, Adam, Esq., M.D., Duntocher
- Gilmour, Thos. F., Esq., Surgeon, 60 Pollock Street, Glasgow
- Glen, James, Esq., M.B., Southbank, Yorkshire
- Goff, Bruce, Esq., M.D., Bothwell
- Gorman, James, Esq., Surgeon, Rutherglen
- Graham, Thomas, Esq., M.D., 34 Gauze Street, Paisley
- Graham, William, Esq., Surgeon, Levenford Villa, Dumbarton
- Gray, James, Esq., M.D., 15 Newton Terrace, Glasgow
- Grieve, Robert, Esq., M.D., Crouch End, London, N.
- Grieve, Robert, Esq., Surgeon, 52 Holmhead Street, Glasgow
- HALDANE, WILLIAM, Esq., M.B., Braemar
- Hardie, John, Esq., M.D., 328 Argyle Street, Glasgow
- Hawkes, Alfred E., Esq., Surgeon, 64 Bedford Street North, Liverpool
- Hay, A., Esq., M.D., Maryhill
- Henderson, Alexander, Esq., Surgeon, Meadowbank Place, Partick
- Henderson, Francis, Esq., M.D., Helensburgh
- Henderson, Thomas B., Esq., M.D., 17 Elmbank Crescent
- Hume, J. C., Esq., Surgeon, Westwood, Oldham
- Humphreys, James, Esq., Surgeon, Bonhill
- Hunter, Matthew, Esq., M.D., 14 Craig Park, Dennistoun
- Hunter, Wm., Esq., M.D., Rothesay
- IRVINE, A. K., Esq., M.D., 3 Newton Terrace, Glasgow
- Irvine, W. S., Esq., M.D., Pitlochry
- JACKSON, DANIEL, Esq., M.D., Hexham, Northumberland
- KELLY, A. L., Esq., M.D., Carlton Place, Glasgow

- Kerr, Wm. S., Esq., M.D., Dumfries
 Kinnier, Robert S., Esq., Surgeon, Saltcoats
 Kirkwood, Robert, Esq., M.D., Largs
 Knox, David, N., M.A., M.B., 8 Belgrave Terrace, Hillhead
- LACE, JAMES, J., Esq., Surgeon, Chapel Road, Frizington, Cumberland
 Lang, Alexander M., Esq., M.B., Broomloan, Govan
 Lapraik, Thomas, Esq., M.D., 83 Stirling Road, Glasgow
 Leckie, David, Esq., M.B., Surgeon H.M. British Army, India
 Leishman, William, Esq., M.D., 11 Woodside Crescent, Glasgow
 Lennox, W. W., Esq., M.D., Hamilton
 Lilly, J. H., Esq., Surgeon, Western Infirmary, Glasgow
 Lister, Joseph, Esq., F.R.S., Charlotte Square, Edinburgh
 Livingston, John, Esq., M.D., New Barnet, Herts
 Longmuir, Jas., Esq., M.D., Bathgate
 Lothian, John A., Esq., M.D., 87 Sauchiehall Street, Glasgow
 Lyon, Walter, Esq., M.B. Houghton-le-Spring, Durham
- McBRIDE, JOHN, Esq., Surgeon, Belmont, Forkhill, Ireland
 McCall, James, Esq., M.R.C.V.S., Veterinary College, Glasgow
 Maccall, William N., Esq., M.D., 207 York Street, Cheetham, Manchester
 McCarron, John, Esq., Surgeon, 300 Duke Street, Glasgow
 McColl, Duncan, Esq., Surgeon, Salen, by Aras, Mull
 McConville, John, Esq., M.D., 27 Elmbank Street, Glasgow
 McDonald, J. D., Esq., M.B., Drymen
 MEWEN, George, Esq., Surgeon, 196 Pitt Street, Glasgow
 MEWEN, William, Esq., M.D., 73 Bath Street, Glasgow
 MacFadyen, Donald, Esq., M.D., 7 Viewfield Place, Stirling
 McFarlane, W. D., Esq., M.D., Bushy
 MacGill, William, Esq., M.D., 6 Bothwell Terrace, Hillhead
- Mackechnie, David, Esq., Surgeon, West Hartlepool, Durham
 M'Kechnie, William, Esq., M.D., Thorndean House, Greenock
 M'Kellar, P. H., Esq., M.D., Smallpox Hospital, Stockwell, London
 M'Kellar, John, Esq., M.D., Tarbert, Harris, Inverness-shire
 Mack, Wm., Esq., M.D., Eaglesham
 Mackay, A. F., Esq., Surgeon, 121 High Street, Glasgow
 Mackay, C. Gordon, M.B., Lochcarron
 Mackechnie, Robert A., Esq., M.B., Rutherglen
 Mackenzie, John, Esq., M.D., Tighnabruich
 Mackenzie, W. S., Esq., Surgeon, Larkhall
 Mackintosh, Alexander, Esq., M.D., 26 Woodside Place, Glasgow
 MacLachlan, William, Esq., M.D., Doon Bank, Patna
 MacLaren, J. D., Esq., M.D., 16 Newton Terrace, Glasgow
 Maclean, Daniel, Esq., M.D., 148 Holland Street, Glasgow
 Macleod, George, H. B., Esq., M.D., 10 Woodside Crescent, Glasgow
 MacMillan, Edward, Esq., Surgeon, 89 King Street, Glasgow
 M'Nab, John, Esq., M.D., Loch Inver, Sutherland
 M'Nicol, Hugh, Esq., Surgeon, Cladoch-Kirkibost, Lochmaddy, Inverness-shire
 M'Vail, David C., Esq., Surgeon, 24 Abercorn Street, Glasgow
- MAHONY, O'BRIEN, Esq., Surgeon, Clonmel, Ireland
 Malloch, Archibald E., Esq., M.D., Hamilton, Ontario, Canada West
 Marshall, Andrew, Esq., M.D., 24 Stephenson Terrace, Preston
 Marshall, John S., Esq., M.D., Hamilton
 Marshall, Wm., Esq., M.D., Mortlake, Surrey, London, S.W.
 Mather, George, R., Esq., M.D., 11 Annfield Place, Glasgow
 Meiklem, John P., Esq., Surgeon, 129 Paisley Road, Glasgow
 Miller, George, Esq., M.D., 102 Bath Street, Glasgow

Miller, Hugh, Esq., M.D., 298 Bath Crescent
 Miller, Matthew, Esq., M.D., 8 Canning Place, Glasgow
 Milne, T., Esq., M.D., Mount Pleasant Manse, Ferryhill, Durham
 Milne, Thomas, Esq., M.B., New Deer, Aberdeenshire
 Mitchell, John, Esq., M.D., Barnard Castle, Durham
 Moore, S. J., Esq., M.D., 15 Blytheswood Square, Glasgow
 Morton, A., Esq., Surgeon, 10 Royal Crescent, Crosshill
 Morton, James, Esq., M.D., 199 Bath Street, Glasgow
 Munro, Æneas, Esq., M.D.
 Munro, Donald, Esq., Glasgow University

NAISMITH, WILLIAM, Esq., M.D., Hamilton
 Nash, James, C., Esq., M.B., Rosemount Cottage, Slamannan
 Niven, John, Esq., Surgeon, 317 Paisley Road, Glasgow

ORR, R. SCOTT, Esq., M.D., 9 Albany Place, Glasgow
 Osborne, J. A., Esq., M.D., Milford, Letterkenny, Co. Donegal

PARKER, JOHN, Esq. M.D., Ningpo, China
 Paterson, Jas., Esq., Surgeon, Airdrie
 Patterson, Alexander, Esq., M.D., 22 India Street, Glasgow
 Paton, Thomas W., Esq., Surgeon, 10½ Eglinton Street, Glasgow
 Patrick, Wm., Esq., Surgeon, 148 New Dalmarnock Road, Glasgow
 Paxton, John, Esq., M.D., Winton Place, Kilmarnock
 Pearson, A., Esq., M.D., 162 Houston Street, Glasgow
 Perry, Robert, Esq., M.D., 11 Queen's Terrace, Glasgow
 Pinkerton, J., Esq., M.D., India
 Pirie, John, Esq., M.D., 26 Elmbank Crescent
 Pirion, Monsieur, M.D., Quimper, Finesterre, France
 Pollock, John, Esq., Surgeon, Springbank, Newton-Mearns

Pritchard, Thos., Esq., M. D., Abington Abbey, Northampton
 Pride, David, Esq., M.D., Neilston
 Pringle, H. T., M.D., Bridgend, Wales

RAINY, HARRY, Esq., M.D., 2 Woodside Place, Glasgow
 Ramsay, Robert H., Esq., M.D., Duncan House, Torquay
 Ramsay, Robert, Esq., M.D., Lochwinnoch
 Reid, Thomas, Esq., M.D., 11 Elmbank Street, Glasgow
 Reid, William L., Esq., M.D., 258 Dumbarton Road, Glasgow
 Reid, W., Esq., M.B., Fever Hospital, Belvidere
 Reid, Wm., Esq., Surgeon, 2 Morris Place, Monteith Row, Glasgow
 Renfrew, Robert, Esq., M.D., 42 Lansdowne Crescent
 Renton, James C., Esq., M.D., 18 St James' Terrace, Hillhead
 Ritchie, Andrew, Esq., M.B., Pollokshaws
 Richmond, A. F., Esq., M.D., 21 Patrick Street, Greenock
 Richmond, Daniel, Esq., M.D., 32 New Street, Paisley
 Robertson, Alexander, Esq., M.D., Town's Hospital, Glasgow
 Robertson, A. M., Esq., Surgeon, 314 St Vincent Street, Glasgow
 Roy, Gopal Chunder, Esq., M.D., Calcutta
 Ronald, Geo., Esq., M.D., Montrose Asylum, Montrose
 Russell, James B., Esq., M.D., 278 Bath Street, Glasgow

SCANLAN, J., Esq., M.D., 62 Buccleuch Street, Glasgow
 Scott, John, Esq., M.D., New Street, Sandwich, Kent
 Sim, J. Brown, Esq., M.B., St Ann's Lodge, Nottingham
 Sime, David E., M.B., Innellan.
 Simpson, Alex. R., Esq., M.D., Edinburgh
 Simpson, P. A., Esq., M.D., 216 West George Street, Glasgow
 Sloan, Samuel, Esq., M.D., 4 Canning Place, Glasgow

- Sloan, William, Esq., M.D., Dalry,
Ayrshire
Smart, R., Esq., M.D., 6 Falkland
Place, Glasgow
Smith, A. Wood, Esq., M.D., 5 New-
ton Terrace, Glasgow
Smith, James A., Esq., M.D., Spring-
burn, Glasgow
Smith, Thomas, Esq., Surgeon, 23
Buccleuch Street, Glasgow
Snape, Joseph, Esq., M.R.C.S.E.,
Southport
Sneddon, W., Esq., M.D., Beith
Spiers, Douglas, Esq., M.D.,
Sauchiehall Street, Glasgow
Stewart, D. P., Esq., Surgeon, Vic-
toria Place, Kirkintilloch
Stewart, Peter, Esq., M.D., 1 Albany
Place, Sauchiehall Street, Glasgow
- TANNAHILL, R. D., Esq., M.D.,
Eden Villa, Lenzie
Taylor, David, Esq., M.D., Paisley
Taylor, M. H., Esq., M.B., High
Street, Johnstone
Taylor, Jas. J. B., Esq., M.D., Ul-
verstone, Lancashire
Taylor, H. C., Esq., M.D., 104 Crown
Street, Glasgow
Tennent, Gavin P., Esq., M.D., 120
Bath Street, Glasgow
Thomas, James, Esq., M.D., Selkirk
Thomas, Moses, Esq., M.D., Royal
Infirmary, Glasgow
Thomson, Allen, Esq., M.D., The
College, Glasgow
Thomson, A. T., Esq., M.D., Clyde,
Otago, New Zealand
Thomson, Hugh, Esq., M.D., 330
Renfrew Street, Glasgow
Turnbull, M. B., Esq., M.D., Ruth-
erglen
Turner, Rev. G. A., M.D., Naviga-
tor's Islands, Sydney
- WALKER, DAVID, Esq., Surgeon, 157
Castle Street, Glasgow
Walker, Wm., Esq., M.D. Pollok-
shaws
- Wallace, James, Esq., M.D., 16
Union Street, Greenock
Watson, Eben., Esq., M.D., 1 Wood-
side Terrace, Glasgow
Watson, R., Esq., M.D., 169 New
City Road, Glasgow
Watt, J. R., Esq., M.B., Ayr
Weir, John, Esq., M.D., 25 Sandy-
ford Place
Weir, Wm., Esq., M.D., Faculty
Hall, Glasgow
White, Francis J., Esq., M.D.,
Athol Place, Perth
White, John, Esq., M.D., 1 Great
Wellington Street, Glasgow
Whitelaw, W., Esq., M.D., Kirkin-
tilloch
Whitson, James, Esq., M.B., 14
Somerset Place, Glasgow
Whittaker, J. T., Esq., M.B., 17
Clarendon Place, Glasgow
Willis, George, Esq., Surgeon, Bailie-
ston
Wilson, A.T., Esq., Surgeon, Len-
noxton, Campsie
Wilson, J. G., Esq., M.D., 9 Wood-
side Crescent, Glasgow
Wilson, John, Esq., M.D., 2 Eton
Gardens, Hillhead
Wilson, Robert, Esq., Surgeon,
Coatbridge
Wilson, Wm. A., Esq., M.D., Green-
ock
Wolfe, J. R., Esq., M.D., 238 West
George Street, Glasgow
Wood, Thomas B. H., Esq., Surgeon,
Strone
Woodburn, James C., Esq., M.D.,
137 Sauchiehall Street, Glasgow
Wright, Strethill, M.D., Barnhill,
Glasgow
Wylie, Adam H., Esq., M.D., 93
Manchester Street, Oldham
- YELLOWLEES, DAVID, M.D., Gart-
navel, Glasgow
Young, James, Esq., M.D., Tarbol-
ton, Ayrshire
Young, Prof. John, M.D., 13 Hill
head Gardens, Glasgow

THE
GLASGOW MEDICAL JOURNAL.

October, 1875.

Original Articles.

I.—LECTURES ON CLINICAL MEDICINE.

By DR M'CALL ANDERSON, *Professor of Clinical Medicine in the University of Glasgow.*

I.—CASE OF HYSTERIA.*

GENTLEMEN,—Many of you have been puzzled to account for the symptoms present in the patient who lies in Bed 4 of Ward V. Let me therefore, in the first place, read you the history which she gave us, and then let us see what we can make of her case. She is 19 years of age, unmarried, a domestic servant, and she entered the Hospital November 19th, 1874.† She complained of pain at the epigastrium and vomiting of blood of twelve months', vomiting of food of six months', fits of one month's, and retention of urine of two weeks' duration. Her father died of "intestinal disease," and her mother at 32 in childbed. She has only one brother alive, eight brothers and sisters being dead, one from bronchitis, and one from small-pox, and the rest from fever. She has been in service since she was 11 years of age, and until the commencement of the present illness she has enjoyed good health, with the exception of an "ulcerated throat," which she says troubled her for two years. Her diet has always been good and her habits

* Delivered in the Western Infirmary of Glasgow, December 11th, 1874.

† Case reported by Dr Charles J. Plumer.

regular. The catamenia appeared at the age of 16 and continued regular, although attended by much pain in the back and head, and sickness, till nine months ago, when they ceased entirely, and since then she has had a constant leucorrhœal discharge.

The epigastric pain came on quite suddenly one evening when she was carrying a heavy tray up stairs. It was of a sharp, tearing character, and caused her to let the tray fall and to stagger to the ground. After this she was confined to bed for five weeks, and is said to have suffered constant pain. Subsequent to this, after taking a short walk, she was seized with sudden faintness, nausea, and increased pain, followed shortly by the vomiting of a considerable quantity of blood. These attacks have recurred almost every day since then, and always about five o'clock in the afternoon; she knows when one is impending, owing to the occurrence of a creeping sensation in the stomach, accompanied by an increase of the pain. After suffering for five weeks she went to the Glasgow Royal Infirmary, where she was treated for three months, and thinking herself well she then returned to work for a few weeks. The vomiting of blood continued, however, unrelieved, and the other symptoms became again aggravated, so that she returned to the hospital for two months more. About this time she began to vomit everything which she took, and continued to do so up to the date of her admission. About a month ago she was suddenly seized, while sitting at the fire one evening, with giddiness, nausea, and faintness, and fell to the floor insensible. The same thing happened about a week ago twice in one day.

Three weeks ago she began to experience pain and scalding when passing water, and had some difficulty in emptying the bladder. This gradually increased till only a few drops could be made at a time, and a fortnight ago the flow ceased entirely, necessitating the use of the catheter twice a day. During the past year the bowels have been very costive, and for some months injections have been necessary to open them. She has often noticed that the

evacuations were very dark, and she says that she has not been moved for a fortnight.

During the last three weeks her feet, legs, and abdomen are said to have been swelled several times, but the swelling has been relieved by putting her feet in hot water, and by assuming the recumbent posture.

Now, if we analyse these symptoms we find that there is manifest derangement (1) of the digestive system, (2) of the genito-urinary system, and (3) of the nervous system.

Let me refer to each of these in succession, and first of all to the *derangement of the digestive system*. The patient's tongue is coated with a thick white fur, she is not thirsty, but she has no appetite. She complains of pain in the stomach, and of tenderness in the epigastric region; she vomits and sometimes puts up blood, and her bowels are exceedingly costive. Such a catalogue of symptoms at once suggests the suspicion that she may have ulceration of the stomach. Let us see whether this view can be sustained. (1) The symptoms of ulcer set in gradually as a rule: the patient at first complains of dyspeptic symptoms, and it is only by degrees that the disease emerges from the mist which in the early stage obscures it. But our patient's stomach symptoms set in almost instantaneously when carrying a heavy tray upstairs.

(2) A patient with ulceration of a year's standing is generally cachectic and pallid, the features are wrinkled and expressive of anxiety and distress, and there is emaciation; but our patient is plump and rosy, and healthy-looking.

(3) In ulceration of the stomach there is pain of a gnawing or burning character, coming on shortly after food is taken, and gradually increasing in intensity until the contents of the stomach are discharged by vomiting, after which the pain generally subsides. Our patient, on the other hand, tells us that the pain is of a pricking character; does not come on until some time after food is taken; is as severe at first as it is after a time, and does not end with vomiting. In ulceration, too, it is hard, hot, and irritating food which is specially provocative of pain, while in our case

the pain comes on equally after a mouthful of water or a beefsteak.

(4) Again, in ulceration, localised tenderness is frequently complained of immediately beneath the ensiform cartilage, and from this our patient apparently suffers, but it is difficult to believe that there is any real tenderness, for when the part was touched at first she nearly sprang out of bed, but when her attention was directed to other matters, she did not complain at all.

The symptoms characteristic of ulceration of the stomach will be more fully impressed upon your minds if I recall the case of a woman who was admitted into Ward IX. on the 4th November, 1874. She was 46 years of age, and she complained of pain in the epigastrium and chest, shooting through to the back and up the neck, of vomiting, hæmatemesis, and anorexia of two years' duration. She was married at the age of 26, and has had three children, her catamenia were regular until three years ago, when menstruation ceased, and for twelve months thereafter she suffered constantly from leucorrhœa.

Two years ago she began to complain of pain in the epigastrium of a gnawing character, which gradually increased in severity; it always came on soon after taking food, especially hard, hot, or irritating food, and rapidly increased in severity until she vomited the contents of the stomach, after which she was relieved for the time. One morning, about a month after the onset of the pain, and soon after breakfast, she was suddenly seized with giddiness, faintness, and nausea, and she vomited a basinful of blood. Nine months after the first attack of hæmatemesis she had an attack of epistaxis, necessitating plugging of the nostrils, and six months ago she had a second attack of hæmatemesis, when, however, only a small quantity of blood was lost.

After her admission there was no more vomiting of blood, but the pain and vomiting after food continued unabated, and she complained greatly of weakness. Her tongue was slightly coated and her appetite was fair, but she was afraid

to eat. Her bowels were very costive, and there was distinct localised tenderness immediately below the ensiform cartilage and at the corresponding part of the spine behind. There was no fever, though considerable emaciation, pallor, and anxiety of countenance, and with the exception of the stomach, the internal organs were healthy.

Here, then, we have a very different history from that given by our other patient, although there is in some respects a superficial resemblance between the two, and I am led to conclude that she is not labouring under ulceration of the stomach at all, but that her stomach symptoms are due to hysteria. Now, you may very naturally say that although the other symptoms may have no real foundation in fact, surely the vomiting of blood must be real. This is by no means certain, however. In cases of ulceration the hæmorrhage is usually profuse, and takes place after food, at a time when the blood-vessels of the stomach are gorged with blood, whereas in our patient the vomiting occurred very regularly at five o'clock, and unconnected with the taking of food, and it was discharged in small quantities only. My suspicions having been aroused, the nurse was directed to watch the patient narrowly, and since that time no blood has been put up, a circumstance well calculated to confirm the suspicion that the hæmorrhage was either extraneous, or was brought about by some act of the patient herself. Some time ago I had under my care in the Royal Infirmary a woman who presented symptoms somewhat similar to those met with in the present case, including the vomiting of blood, and for a long time we could not tell where it came from. I therefore had the patient watched, when the nurse discovered that she was in the habit of retiring into the scullery, where she made her gums bleed by pricking them, after which she returned into the Ward and had her usual attack. I think it was Dr Bennett of Edinburgh who reported the case of a patient who had suspicious vomiting of blood, which, on microscopic examination, was found not to be human blood at all, for the blood corpuscles were oval. So you see we must not be led away

from the diagnosis of hysteria merely because there is apparent hæmatemesis.

Secondly—*There is derangement of the genito-urinary system.* Amenorrhœa is a very frequent accompaniment of hysteria, whether as cause or effect I shall not pause to enquire at the present time; while retention of urine in a young woman in whom there is no apparent cause to account for it is a very usual symptom of hysteria. And here let me pause for a moment to refer to the diagnosis of retention of urine as a symptom of disease, because this is by no means such a simple matter as you might suppose, unless care is taken, and because I have frequently seen mistakes made with regard to it. Our patient on admission had a tumour in the hypogastric region, and on enquiring she informed us that she was making water more frequently than usual. You are very apt to suppose from this that the tumour is not a distended bladder, but on the contrary it should rather increase your suspicions in that direction, because when the bladder is distended, although the sphincter does not relax, there is apt to be an overflow in the shape of frequent dribbling of urine. In doubtful cases the use of the catheter clears up the difficulty, but then you should not use the ordinary silver female catheter, as, owing to the stretching of the neck of the bladder, it may not fairly enter the viscus, but a long gum elastic one such as we use for the male. Even then your diagnosis is not absolutely certain, as the following case, which the late Dr McFarlane used to tell us in his lectures on Practice of Medicine, will show. A medical man suffered from gradually increasing distension of the abdomen, which at last became enormous, and he himself supposed that he was dropsical. A medical friend suspected, however, that the symptoms were due to retention of urine. A catheter was accordingly introduced, and a very large quantity of urine removed, but this only reduced the tumour one half. Three days after the patient died, and on *post-mortem* examination it was found that the bladder had an hour-glass contraction in the middle, and upon the orifice of communication between the two chambers lay a flat calculus.

thus preventing the escape of the urine from the upper part of the bladder when the catheter was introduced. In the great majority of instances, however, if you are on your guard, and use the catheter, an error of diagnosis is not likely to occur.

Thirdly—*There is derangement of the nervous system.* About a month previous to admission she had what was described as a fit, and after she entered the hospital she had several. Now, epileptiform seizures often occur in hysterical subjects, and we had little difficulty in this case in making the diagnosis of hysterical epilepsy, partly owing to what has been already stated, but chiefly for the following reasons. A true epileptic seizure presents the following characters in typical cases. The "aura epileptica," which varies in character, immediately precedes the fit: the patient falls to the ground insensible, pallid and rigid, but the pallor soon gives place to lividity, and the rigidity to clonic convulsions, which are more marked upon one side of the body than the other, and are frequently associated with foaming at the mouth, which may be bloody if the tongue is bitten. The pupils are dilated and do not respond to light, and the eye is so insensible that you may touch the cornea without the patient wincing. The convulsive movements soon begin to subside, but the patient at first is in a state of stupor, and has a great tendency to sleep. In our patient, on the other hand, the phenomena of the paroxysm were very different. She could tell for hours before an attack set in that it was impending. During the paroxysms both sides were equally affected, and the convulsion was very demonstrative. She flung her arms about, and cried, and moaned. The paroxysms lasted longer than a true epileptic convulsion; the insensibility was not complete; the cornea was sensitive, and the pupil was not dilated, and finally the seizure ended in a fit of crying or of laughing.

We have come to the conclusion, then, that the derangements of the digestive, genito-urinary, and nervous systems are manifestations of hysteria. But what is hysteria? If you ask a medical man this question he will, perhaps, tell

you that he can tell it when he sees it, but that he cannot accurately define it; and truth to say, it is very difficult of definition, because we really cannot say in what it essentially consists, and because it may simulate almost every known disease. It gives evidence of its presence in a distinct perversion of the moral and physical well-being of the individual attacked, a perversion which is of a purely functional nature, and yet which may occur as a complication, and be called into activity as the result of organic disease. We know really very little of its ætiology. In persons who are predisposed to it, depression of the system, such as results from diarrhoea, over-lactation, and the like, is apt to call it into activity; it is also likely to follow upon sudden fear, agitation, or anxiety. It is much more generally met with in females than in males, because, probably, they are endowed with more delicate and more sensitive nervous systems, and when it occurs in males, it may be because their nervous systems are of the feminine type. In females it usually commences about the age of puberty. Thus, of 351 recorded cases of hysteria, 273 patients had their first attack between the ages of 10 and 25. When males are affected it is generally late in life. It is more frequent in unmarried than in married females, and it would seem to be often associated with menstrual disorders and displacements of the uterus; but we must not exalt these conditions too much as causes of hysteria, for if there be a predisposition to attacks, any derangement of any organ may call it into being. "Some women," says Reynolds, "are as little likely to become hysterical as some men are to fall pregnant; they are of masculine build, both mental and bodily, and their existence and predispositions to disease furnish another proof of the truth of the general proposition, that it is in the nervous endowments, and not in the nature of the reproductive apparatus, that the special predisposition lies." * The same writer has also well remarked that "absence of employment, as it is commonly met with among the upper classes, favours

* *A System of Medicine*, vol. ii., art. Hysteria, by J. Russell Reynolds, M.D., p. 307. Macmillan & Co., London, 1868.

the production of hysteria in women," and that "overwork, anxiety, and great strain upon the intellectual and moral faculties, lead to the development of hysteria in man." * One other circumstance must be kept in mind from an aetiological point of view, and that is, that the disease is at times hereditary, occurring as it does in certain families, and cropping up amongst them in a remarkable manner, depending, no doubt, upon a particular vice or quality of the nervous system; but at the same time it may happen, when it occurs both in mother and child, as the result of imitation rather than of hereditary tendency, thus illustrating the truth of the old saying, that "as the old cock crows the young one learns."

The treatment of cases of this kind is always tedious and requires very careful regulation, but in carrying it out we must operate upon the mind rather than directly upon the body. We must on no account whatever make light of our patient's symptoms, we must listen attentively to all her complaints, and make her feel that we consider them real, but at the same time we should hold out good prospects of ultimate recovery. We must try, as much as possible, to take the patient out of herself by interesting her in other persons or in other things; we must make her feel that she is useful to others, but for their sakes, not for the purpose of benefiting herself. With this object in view we have asked our patient to leave her bed, and to assist the head nurse in the work of the wards, on the plea that many of the other patients are very ill, and that the nurse is unable to give sufficient personal attention to them all. In addition to this, we are apparently attacking with energy the ailments of which she specially complains. Besides attention to her general health, we have applied a belladonna plaster for the cure of the fancied epigastric pain. For the relief of the constipation and retention of urine and amenorrhœa we have resorted to Faradisation, one pole being applied to the lower part of the spine, and the other at first above the pubis, and then upwards in the direction of the colon. At the menstrual periods,

* *op. cit.*, p. 309.

too, she is to have warm hip baths, and her bowels are to be kept freely open with aloes and iron pills. I have very little faith in anti-hysterical remedies apart from the impression which their nauseous taste makes upon the mind, and I close these few observations by repeating, that in the treatment of hysteria, we must endeavour to cure by moral rather than by medicinal measures.

II.—RECORD OF AN EPIDEMIC OF CHICKENPOX.

By SAMSON GEMMELL, M.B., Medical Superintendent, City of Glasgow Fever Hospital.

DURING the winter of 1874-75 two small isolated epidemics of chickenpox occurred in the City of Glasgow Fever Hospital. It was occupied at the time, and had been for some months previous, by scarlet fever alone. It is only when the patients are under such immediate control as in an hospital that this disease can be satisfactorily studied, its transitory nature and its almost total freedom from grave results having led the public to look upon it as a very trifling affection, requiring little medical supervision. As I had the opportunity of minute and prolonged observation of these two epidemics, I have thought it my duty to offer the following details as a contribution to the subject.

At the present time the doctrine of the non-identity of smallpox and chickenpox, as originally laid down by Fuller and Heberden in last century, obtains almost universally on the Continent, and to a great extent in this country. Hebra, however, lends the authority of his great name to the opposite belief, maintaining that variola can breed varicella, and *vice versa*. Dr Bathurst Woodman, too, the translator of Wunderlich's work on Thermometry, states in a footnote that his experience of various epidemics of smallpox more and more forces upon his mind the essential identity of variola and varicella. As during 1873-74 I had closely observed a great epidemic of smallpox, I was necessarily much interested in this attack of chickenpox, and in comparing

and contrasting the course and symptoms of the two diseases. After the most careful observation, the doctrine of non-identity seems to me to be beyond all doubt. The two diseases differ so obviously and so totally in many important features that I am inclined to think with Fuller, who very quaintly remarks, "Smallpox cannot breed chickenpox any more than a hen can breed a duck." At the first glance the two eruptions bear a considerable resemblance to each other, and this may lead to errors in diagnosis, but any one who carefully studies the eruption, and carries along with him all the facts of the case, will rarely confound the two.

The epidemics were separated by an interval of a month; the first comprising a group of 13 cases, the last 7. The type of the disease was essentially the same throughout. Three-fourths of the patients were under five years of age, and in no one attacked did the age exceed 10. The relation to vaccination was made a special point of inquiry—13 had very good vaccination marks, none less than two, and one as many as six, done only seven months previous; five were badly vaccinated, and two unvaccinated. One of this last group was vaccinated after the attack of varicella. The vaccine took well, the vesicles ran the usual course, and the resulting cicatrices were good. The number or excellence of the vaccination marks did not appear to influence the course of the disease, as the most acute case, and the only one which gave any anxiety as to its result, had three good vaccination marks, while the two unvaccinated cases, except for the presence of the eruption, could hardly be said to be ill at all. All the cases recovered.

Incubation.—This period has been very variously estimated. Gregory says less than a week, Trousseau 15 to 17 days, and Professor Henoch, in a recent number of the Berlin Medical Society's Transactions, records a case in which he was able to fix the incubation period at at least three weeks. The general impression seems to be that it is about 14 days, but the conflicting opinions on the subject almost force upon us the belief that this period is variable. In two cases, however, I was able to fix it pretty exactly. The following are the

facts:—On November 20, 1874, Michael M. was admitted desquamating from scarlet fever, and on the second day after his admission a well-marked eruption of chickenpox appeared on his body. On enquiry, chickenpox was found to be prevalent in the locality from which he came. This lad's brother, William, had been in hospital with scarlet fever for five weeks prior to the admission of Michael, and when his brother came in William asked to be allowed to sleep in the same bed with him, and this was granted. On the fourth day after his contact with Michael, William was a little sick, and on the morning of the fifth the chickenpox rash was present. Four others took it within 10 days, and after several cases had occurred the ward was closed, thoroughly fumigated, and all the woodwork washed with carbolic soap. Unfortunately the bed ticks were allowed to remain. After standing empty for about a month patients from another ward were transferred to it, and on the fifth day from that date Rachael D. had the characteristic eruption present. She had never been in the ward before, and so far as could be ascertained she had had no connection with any cases of chickenpox. Her brother, John, who was admitted along with her, took ill three days later. In the cases, then, of William M. and Rachael D. the incubation period was in all probability within five days.

The *premonitory symptoms* are stated by all authors to be trifling, and within my own observation this holds true. In many cases they were so slight as never to attract attention, and it was only the appearance of the eruption that gave the first hint of the disease. But where premonitory symptoms were present they usually amounted to nothing more than slight nausea and disinclination for food. In none of the cases did vomiting or severe pain in the back occur, and anything like severe headache was present in only one case. All this contrasts very strongly with smallpox, where, even in slight and modified cases, the premonitory symptoms are often very severe.

Nature and course of the eruption.—The eruption generally made its appearance in from 12 to 24 hours after the premonitory symptoms set in. In all cases it appears first on

the body, generally on the back. From this it usually extended, if the rash proved to be at all copious, to the extremities and head. I never observed it present, however, on the palms of the hands or soles of the feet, and in no case did the eruption make its first appearance on the face*; and when it did extend to the head it was usually much more profuse on the hairy scalp than on the face. If the attack is at all severe the eruption may spread to the mucous membrane of the mouth, pharynx, and even larynx. I have not noticed that writers on the subject call sufficient attention to this distribution of the eruption, and I have frequently heard cases of undoubted chickenpox pronounced smallpox, owing to the presence of eruption on the mucous membrane of the mouth, the idea being that such an extension of the eruption is confined to variola. But while the eruptions may be present in both diseases on the mucous membrane of the respiratory tract, the time of its accession to that membrane seems to differ in the two affections. It is well known that in unmodified smallpox, and even in modified smallpox of a severe type, the eruption invades the mucous membrane of the mouth and larynx at an early period. In many cases, indeed, I have been able to detect the rash in these situations before it was apparent, or at all events well pronounced, on the skin. Again, the sore throat in smallpox is chiefly due to the presence of the rash, and any one at all conversant with the disease knows that it is usually an early symptom. Varicella would seem to present a contrast in this respect; and the mode of evolution of the rash in the two diseases would lead us to expect this, for while in smallpox the eruption, in most cases, appears first on the face, and therefore in close proximity to the mucous membrane of the mouth, in chickenpox the extension of the rash to the face is usually secondary. In only two cases in the epidemic did this extension of the eruption to the mucous membrane occur, although it was carefully sought for in all; and in these two cases this extension of the

* Thomas, in the article *Varicella* in Ziemssen's recent *Cyclopaedia of Medicine*, states that the eruption usually, though not always, makes its first appearance on the face. This is quite contrary to my experience.

eruption was late. In the case of Margt. D. the eruption of chickenpox appeared on February 3rd. and although her mouth was carefully examined daily, it was not until the morning of the fourth day after the rash had appeared that it was detected in the mouth. It ultimately extended to the larynx, and the voice became very hoarse. In another case the eruption did not appear on the mucous membrane of the mouth till the third day of the rash, and in several cases which I have seen casually, where, however, I had not the same facilities for observation, the eruption has appeared to invade the mouth at a late period. It is only, of course, in severe cases that this extension takes place, but should further experience tend to confirm the above observation, it may, in some cases, come to be a valuable aid in the differentiation of the two diseases.

The eruption usually first appears as a small red papule which rapidly vesicates, but in some instances this papular stage seems to be omitted, and the eruption is vesicular from the first. Unless the vesicle is irritated it has not, as a rule, any inflamed base or areola, but is set on sound skin. The vesicles are very unequal in size. The rash comes out in a series of crops, usually appearing at intervals of about twelve hours, and a fact noticed by Trousseau, but of which I had satisfied myself before I knew of his observation, is that the first appearance of the rash, as well as of its successive crops, occurs most frequently during the night. The result of these successive crops of eruption is that you get vesicles in all stages of development in the same case, and often side by side. This contrasts with smallpox, where, although you get vesicles of different ages, you do not find them occupying the same region. The vesicle in chickenpox, judging from the cases observed, has no tendency to umbilicate as in smallpox, although I by no means claim umbilication as a distinguishing feature of smallpox. In many cases a little scab formed on the top of the vesicles when they were commencing to dry up, and this occasionally gave the appearance of umbilication, but closer examination proved this not to be the case. The fluid in the

vesicles is in the first instance quite clear, but it soon becomes milky, although never so purulent as in variola. The vesicle does not rupture, but dries up; and in no case, except where the eruption had been much irritated, did I detect any pitting. Each vesicle takes from four to six days to run its course, and new vesicles generally continue to appear for from three to five days. If the vesicles are much irritated they tend to take on an ulcerative action, and give rise to sores which are deep, dirty, and often very difficult to heal.

The initiatory *fever* in varicella is in most cases very slight, although West records it as his experience that in rare cases it may be as violent as in either measles or scarlatina. In most of the cases observed in this hospital the fever was of the very slightest nature, rarely exceeding the normal by more than half a degree, or one degree Fahrenheit. In one case, however, the fever was very acute, running as high as $104^{\circ}\cdot 8$ F. The general belief is that the fever which accompanies the eruption is very slight, some even denying its presence altogether. Thomas, however, in an article in the *Archiv der Heilkunde*, states that sometimes even in the incubation stage there is slight elevation of temperature, and during the eruption he has, in many cases, found the temperature raised a few tenths, but in rather severe cases it has run as high as $38^{\circ}\cdot 5$ C. ($101^{\circ}\cdot 5$ F.) and 40° C. (104° F.), but seldom more. Dr Ramsay records a case in the *British Medical Journal* for 1871 (page 35), where the temperature ran up to $103^{\circ}\cdot 8$ F.; and Professor Hensch, in the *Verhandlungen der Berliner Medicinischen Gesellschaft* for 1874, gives the temperature chart of a case in which the fever reached the extreme height of $105^{\circ}\cdot 8$ F. In my own case above referred to, the temperature chart was as follows:—

1st day,	Morning	101°	Evening	$101^{\circ}\cdot 8$	Rash appeared during night.
2nd "	"	100°	"	103°	
3rd "	"	$103^{\circ}\cdot 4$	"	$104^{\circ}\cdot 8$	Rash continued to appear up to the sixth day.
4th "	"	$102^{\circ}\cdot 8$	"	102°	
5th "	"	103°	"	$104^{\circ}\cdot 4$	
6th "	"	$101^{\circ}\cdot 2$	"	103°	
7th "	"	$99^{\circ}\cdot 8$	"	99°	

In all these cases of high temperature, however, the eruption was very copious. As a rule the temperature was little disturbed, but as long as the rash was appearing there was a tendency to a slight rise at night. Defervescence is rapid, and in no case observed did the fever continue more than nine days. The pulse goes *pari passu* with the temperature, rarely much disturbed, but in some cases running as high as 120, and showing a tendency to dirotism.

The *treatment* adopted was of the mildest type, as it is essentially a self-curative disease. Milk always constituted a large part of the diet, and in one or two cases a little wine was given, but as a rule the ordinary diet was continued, as the appetite rarely failed.

III.—MINERS' ANTHRACOSIS.

By WILLIAM SNEDDON, M.D., *Beith*.

AT the present time, when so much is said about the affairs of miners, and there has been so much legislation for their benefit, the subject of this paper has forced itself upon me. There was much need for the improvement of mines, for until recently they were in a deplorably bad state, nor was there any class of people than miners whose lives were in such danger.

This was due, not only to accidental causes, but to the certain, insidious, and chronic poisoning of the system by the vitiated and dust-impregnated air which existed in all parts of the mines, and which still exists, but to a much less extent, in some parts of mines in different localities. There are some men so short-sighted that they are known to work in the worst place in the mine for a larger rate of wages.

Anthracosis, I shall attempt to show, is in most cases contracted while following the avocation of mining, and whatever facts I adduce have been elicited from men in different localities who have been engaged in that employment for upwards of thirty years. The disease is somewhat rare now, at least in its acute form; but in my short experience,

I have met one well marked case which ended fatally, and caused me to look into the subject, which is one of great interest, in a physiological, pathological, and medico-legislative point of view—physiologically, from the way in which the irritating particles affect the lungs, and the effect they produce on the system; pathologically, from causing the lungs to assume the appearance of another disease, namely, melanosis; medico-legislatively, from the fact that the disease has been nearly annihilated by preventive measures.

Occupation is not an unfrequent cause of disease, but it is more palpable in some cases than others. Anthracosis has been known since the beginning of the present century, and was first studied by British physicians, amongst whom were Gregory, Stratton, M'Kellar, Thomson, Carswell, J. B. Thomson, and others.

The disease has been called by different names by the various investigators. Stratton used the word which I have adopted. It was called "Black Phthisis" by M'Kellar; "Black Spit" by J. B. Thomson; "Spurious Melanosis" by Carswell. The British School at that time considered that it had its origin from some extraneous source; the Continental, that it was due to some change in the lungs themselves, independent of anything in the air; but the opinion of both is now so far modified that they admit both causes.

Virchow, Hasse, and Trousseau supposed it to be caused by the extravasation of blood, whose hæmatin was transformed into a carbonaceous substance. If this be the process, I cannot understand why it should occur more frequently in miners than in others, but think that when we see the expectoration so visibly affected as soon as the miner follows his work, we must search for the cause in his work. The lungs of children, and of animals living in the open air, are free from this black pigment matter, and as age advances, so do the lungs become relatively blacker.

The deposit is seen to be greater in those who are confined to the house, than in those who live mostly out of doors; so it must depend on something in the house, which is supposed to be dust and smoke. The air in all mines is impregnated

more or less with dust and smoke, therefore some of these irritating particles must be inhaled. The lungs for a short time throw off the inhaled particles by means of the cylindrical ciliated epithelium, as has been shown by Rindfleisch by experiments on the frog; but when the dust is in great quantities, or too heavy, it passes into the air vesicles, which are lined with squamous epithelium, and there remains for a time.

In most works, the inhaled particles consist of a carbonaceous substance, which resembles transformed hæmatin, and as the one cannot be chemically distinguished from the other, at least characteristically, therefore this is a source of difficulty. But Zenker has related cases where he found the lungs coloured red from working in an atmosphere impregnated with the dust of the red oxide of iron, hence this disease is called siderosis (or *Eisenlunge*) by the Germans. This analogous deposition is sufficient of itself to warrant us in concluding that anthracosis must have an external source.

I would here throw out the hint that Zenker may yet be corroborated by physicians in Cumberland, where vast fields of red hematite iron ore have been opened up. The Spaniards may assist us a little in this, too, as they have commenced to work the same kind of ore, which is mostly used by our large iron companies who have too little black-band ironstone to smelt with the clay-band. The men in Cumberland, when returning from the labour of the day, appear as if they were painted with ochre, and as this is caused by the dust of the material with which they work falling on a moist surface, it is highly probable that some of it will be inhaled.

I shall now give the history of the fatal case of anthracosis previously referred to:—

A. B., ætat. 27 years, miner, consulted me in April, 1872, and complained most urgently of a sense of fulness over the epigastrium, which was increased after food. Had always a bad taste in mouth, and belched wind frequently, whose taste was fetid and almost unbearable. Had a slight tickling cough, which did not annoy him, and about which he did not concern himself. I gave him *pepsina porci* in pill.

On making my first visit, a few days after, I ascertained the following particulars :

Patient had been working in pits since he was twelve years of age, until he became unable to work about the middle of November, 1871. Was engaged at first in trapping, viz., opening and shutting a door through which the small waggon or hutch required to go. This door acts as a valve, in causing the current of air to go in a particular direction. Was next engaged in driving a pony in the pit, till he was seventeen years of age, and from this time he worked as a miner at the clayband ironstone. Was never engaged in a coal pit. The first thing noticed by him was the frequency of very severe headaches over the vertex, about a year before he stopped work, and to which he never had been subject. They were always increased by the end of the day, and were much worse some days than others. The next thing observed was loss of flesh ; but this was first seen by his friends, and about the same time they thought his shoulders were higher. Felt himself easily tired, and was always drowsy after coming from work, but still was unable to sleep. Had shooting pains through his chest, and a slight tickling cough for four months before seeking advice. Expectoration was increased in quantity about February, and was also thinner and more equally black. Shortly after this its colour changed to what he termed "puddock red ;" but this only continued a short time. Had some difficulty in breathing till the expectoration was increased ; but after that never experienced any. In March his stomach commenced to pain him, and he felt it full and swollen. He thought if his stomach were right he would be well. This seemed to be the opinion of others who had seen him before me ; for when he was at one of the Convalescent Homes he was confined to a small biscuit, three times a day, with a full allowance of water, for a week. Had a bad taste in his mouth till he died, but the pain ceased in April. Tongue was usually clean, and bowels regular. Pulse quick, regular, and rather small. Family history bad.

On making a physical examination of his chest, I found all the symptoms of a cavity in the right lung, about the infra-scapular region ; but it was not extensive. Anteriorly, there

was a little dulness over the apices of both lungs, and in three weeks or so after this there were some suspicious râles in the apex of the left lung. Had hæmoptysis about this time; blood was bright red, and fluid at first, but became darker in colour, and was in "strings," to use his own expression. There was usually a black spit after the blood, which continued about eight days, and never was present except at this time. For a fortnight before he died expectoration was like sooty water, which sometimes ran out of his mouth when he turned himself in bed. Had colliquative sweatings for three months or so before he died in July. Had no greater agony than many ordinary consumptive patients.

The expectoration of all miners soon becomes black, till they have what is commonly called black spit. They do not think anything about it, but look upon it as the necessary consequence of their work. It is a well-known fact amongst miners that those who dig coal have a blacker spit than those engaged in working ironstone. Colliers, as a general rule, use less powder than miners, and the lamp smoke being equal, we have still to seek for the source of difference in the colour of the sputum. This I consider to be due to the difference of colour of the material they are working with; its lighter specific gravity, and its more pulverable quality. The dust is mostly caused by the slow process of digging the coal, as it lies in its natural bed, by what is technically known as "holing," or "pilling." This operation consists in the removal, by pickaxe, of a thin layer of material between the coal and the floor of the workings, in order to allow a space for the coal to fall. In some works the coal falls during the night by the pressure of the weight of the roof on the vacant space between the "face," or perpendicular surface of the coal, and what is called the "stowing," or refuse, which is thrown behind to help to support the roof. When this is the case it is seldom that powder is required.

During the operation of "holing" the body of the miner is in a horizontal position, resting on one elbow, and at every stroke of the pickaxe there is usually a cloud of dust produced, which rolls back in his face. This "holing" is

either the coal itself, or a thin layer of soft fire-clay. But it is usually very different in the case of ironstone, especially clayband, for this is usually very hard, and consists of what is called "fakes."

This dust is increased according to the method of working. If by "stoop and room" method, they cut the coal perpendicularly as well, which operation is called "shearing," but if "long-wall" working, only those who are in the "level," or in the "heading," do this, so that in these places it is always more dusty. The "level" and "heading" are rooms in advance of the other workings, and the current of air does not get into them so well, so that they are always dustier. Again, the dust is very much increased if they use powder in blasting the coal, and particularly so if it be smithy, or coking coal, which is much softer. In some works they require to pound it with hammers to reduce it to dross. It is well known amongst the men themselves that a dry pit is an unhealthy one. However strange this may appear at first sight, it is nevertheless true.

This "holing" is not always in the same position, but is sometimes next the roof or in the centre, dividing the coal or ironstone, and it is then much worse, for the larger particles are more liable to be inhaled, from the fact that the body of the miner is on the same level with the seat of the dust, or even below it. In the case of the ironstone miners, it is not so much the ironstone particles which enter the lungs as the "holing," as in the coal miner. But in this district it is considered more hurtful to the lungs to work at ironstone than coal. Some of the men state that they could tell a collier from an ironstone miner, from the sallow complexion of the latter compared with the ruddy colour of the former.

It will be seen from the above adduced facts that the sputum is influenced to a very great extent by the nature of the minerals worked with, by the quantity of dust in the workings, and the method of working. There can be no doubt but the smoke of lamps and powder must have some influence in this, but it is not the chief cause, as J. B. Thomson states.

Low workings are usually worse than high ones, *cæteris paribus*, in causing the sputum to turn blacker, and this I attribute to the miner requiring to retain the horizontal or semi-recumbent position, and being, therefore, more exposed to any dust there may be. McKellar, J. B. Thomson, and others have stated as one reason, for concluding it is the smoke which is the chief cause, that it is noticed that those who cut the stone wall to reach the coal are usually sooner affected and live shorter than others, because they require to go back amongst the smoke immediately after the "shot" or blasting operation. This has to be done by the most of ironstone miners, and why should they not be more subject to the disease than colliers? When sinking a pit, those engaged go amongst smoke after every shot, and yet their sputum is not materially blackened, nor are they subject to this disease, and this is likely due to the fact that there is always water in the bottom which prevents any dust from rising, and they are usually in the erect position. Warburton Begbie has described in a previous number of this journal a case which could only be caused by dust, for it occurred in a farm labourer, who was never in a smoky atmosphere. Farmers don't care about working in the barn more than one or two days a week, if the grain has been long kept, from the effect it has on their sputum. After a shot is fired there is always a quantity of dust produced, and in cutting for the coal the road has a blind end, so there is not a good return of air, and neither dust nor smoke is carried away.

It will be seen from the history of A. B.'s case that he did not work more than ten years at the "face," that he never worked at coal, and that the disease was quite characteristic. It seems to me that it is a mistake to call it coal miners' phthisis, and I am of opinion that it may become more frequent amongst ironstone miners, because it is mostly the clayband ironstone which is worked now. The disease as shown in his case bears a striking resemblance to ordinary pulmonary phthisis, in the loss of flesh, weakness, cough, loss of appetite, condensation, softening, and formation of cavities in lungs, hæmoptoe, and colliquative sweatings.

It has been stated by M'Kellar that there is sometimes great agony before death, but it will be seen from A. B.'s case that he suffered no more pain than an ordinary phthisical patient. The disease was said never to coexist with ordinary tubercle, but this has been proved to be wrong, by *post-mortem* examinations, and though there was no P. M. in the case of A. B., yet I am convinced, from his family history, that there was every probability of the presence of tubercle.

Anthracosis, I believe, occurs more frequently in colliers than miners, because there is very much more dust in the places worked in by the former than the latter. It is analogous to the disease caused by the dry grinding of cutlery, and the fine hewing of stones. The lungs vary in colour from an ashy gray to a deep black, and more frequently the former is the colour of the external surface, though they are blackest towards the surface of the parenchymatous structure. When the lungs are squeezed, a dark inky fluid exudes from them, which is sometimes sufficiently concentrated to stain the hands. This discolouration often pervades the whole of the lungs, but has no special tendency to affect any particular part, nor is predisposed to affect the one lung in preference to the other. It in this respect differs from tubercular pulmonary phthisis.

In the case of A. B., both lungs were affected, the first cavity being in the right one, and not at the apex. The lung substance is dense at some places, soft at others, so much so that cavities are formed, and it therefore goes through the different pathological stages of tubercle.

It is advanced by those who believe in the smoke as the source of the deposition, that it is of a granular shape, and therefore cannot be coal dust, which usually breaks in an angular form. But, on the other hand, Rindfleisch states that we can very distinctly see upon the particles the sharp edges and pointed angles which give them the penetrating powers, and in one case he found a carbonised so-called dotted cell of fir-wood, upon which he counted seven porous canals side by side. But since the deposit has been found to be of a carbonaceous nature, how

is the dust theory to be reconciled with the fact that all the dust is not carbonaceous? The only explanation of this that I can give is, that those fatal cases which have been examined may have occurred from coal dust, and I may here add that Professor Ferguson of Glasgow University examined the sputum of A. B. without any definite result, at the request of Professor Gairdner, under whose care A. B. was for two weeks in the Royal Infirmary. But we saw in the analogous disease, siderosis, that it was the materials they were working with and not smoke that was deposited.

Rindfleisch states that "all parts of the lung parenchyma are uniformly deluged by this pigment. Upon every connective tissue, septal, alveolar, and infundibular, as well as lobular, besides a depot of larger particles of coal at the centre, we find a less dense accumulation round about at the edges." It is found in the bronchial glands, and they have been known to suppurate into the bronchi from the mechanical irritation of the particles. It is also found in the pleura and mesenteric glands, but not to the same extent, and this is said to militate against its being simply an impaction after inhalation. But colouring matter is noticed in the glands in the vicinity of a tattooed mark, although in this operation only a little colouring matter is used. This is as likely to occur in the case of the lungs as the skin, for they are furnished with an absorbent system. The men themselves consider it is simply inhalation and impaction, for they believe they ought to take a vomit occasionally.

The particles are of such a nature that they penetrate the lung parenchyma, and they will do so where there is the least resistance. After entering the parenchyma, they are seen to follow the current of the extra-vascular fluid, and with this finally tend towards the system of lymph-vessels. It is said by McKellar and others that after this deposition has gone on for some time, there is a deposition of carbon from the blood, from its not being properly oxygenized, the reason adduced for this being the great quantity expectorated after ceasing to work in mines. But why should this black sputum return at indefinite

periods, as has been observed in the case of miners who have afterwards been in the army a long time? Is it not as probable that it is the extraneous deposit which has remained quiescent for a time, till by some change of position, from its mechanical irritation, it has discharged itself into the bronchi, as has been pathologically observed in the case of the bronchial glands?

Having discussed the physiology and pathology of the disease, let us now consider what further preventive measures might be adopted. It is now well established that it is only those who work at the "face" or "wall" that are affected, and not those who follow any of the other kinds of work in the mine, such as "drawing," viz., pushing the small waggon from the "face" to the bottom of the pit or mine, horse-driving, "brushing," viz., the operation for the heightening of roads, &c. The men who follow this last kind of work use more powder than ordinary miners; but they only bore a hole for blasting, and do not require to "pill." Because of this there is not so much dust, and the metals they blast are usually hard; and further, they are in an open road, where there is a current of air.

In the majority of works that I know of, there are special men for each of the employments mentioned. It would be better if the miner, instead of always being confined to his small, dusty, ill-ventilated place, would also assist in drawing his coals, &c., from the "face" to the bottom of the pit, where he would be in a clearer and better air occasionally. It would also be of service to them to put a little water at intervals on the place they are going to "pill." They usually adopt this plan when boring a hole for blasting, but it is subservient to another purpose as well. There are a few works which are so dry that steam jets should be introduced at several parts of the workings in order to moisten the air. This ought to be done in those pits which are deep, for the temperature is very high, and increases in the ratio of 2° Fahrenheit in every hundred feet, until it sometimes reaches 120° Fahrenheit. All mines should be prohibited from being worked if below a certain depth, for the lowness of some workings is such that boys only can

draw the "hutches," and these require to be placed on sledges, and not on wheels.

I think it is disgraceful that men should almost have to crawl on their knees to reach some ill-ventilated nook, and there do a day's work. And since the smoke is a secondary cause, some lamp should be introduced which would produce little smoke. It would be impossible to invent one that would cause more smoke than the one in general use.

Then stationary lamps of superior illuminating power should be placed on the roads, and in the rooms of the miners, instead of each man carrying a lamp on his cap, or other part of his dress. As to the smoke caused by blasting, the only way of getting rid of it is by the better ventilation of mines, and causing stronger currents of air to travel through all parts of the workings.

IV.—THE RESULTS OF SOME INJECTIONS OF THE KIDNEYS IN BRIGHT'S DISEASE, IN RELATION TO ALBUMINURIA AND HEMATURIA.

By DR JOSEPH COATS.

IN injecting the kidneys in some cases of Bright's disease, I was struck by the fact that the injection material ran in several cases into the urinary tubules, and this too in such considerable quantity and in such situations as to suggest that the escape had taken place from the Malpighian vessels. This at once suggested a possible confirmation of the mechanical theory of albuminuria. If in Bright's disease an injection material runs very readily through the Malpighian tufts into the tubules, then it may be presumed that the blood albumen takes a similar course. This has led to an analysis of cases, and to conclusions somewhat different from those at first anticipated.

It will be proper here to speak first of the method employed in these cases. I shall then give the details of the individual cases, and then proceed to consider the results to be deduced from them. I injected the kidneys with a solution

of gelatine coloured with carmine, prepared according to Frey's modification of Gerlach's method. I have used this material somewhat extensively, and entertain a high opinion of its worth. The carmine is in the form of a very fine flocculent precipitate diffused through the gelatine, so that the injection is able to penetrate to canals much finer than the blood-vessels. A similar material was used by Thiersch, and he was able with it to inject the serous channels of a granulating wound; and it has been more recently employed by Arnold, who has demonstrated by means of it the communication of the parenchymatous canals with the blood-vessels on the one hand and the lymphatics on the other. In my own observations, also, I find that this material has in some cases penetrated among the round cells which frequently occur in such quantities in cases of interstitial nephritis. On the other hand, as the carmine is not in solution, but in the form of a fine precipitate, the material only penetrates where apertures exist, does not pass through intact membranes. I have made repeated injections with this material of the organs of man and animals, and have never found it to leave the vessels in normal cases. Of late I have several times injected normal human kidneys, sometimes using an excess of pressure, but the material has remained within the vessels.

In my injections I have used a syringe which holds a quarter of an ounce, refilling it as often as required. A fine canula was first introduced into the renal artery or one of its branches, and then the syringe fixed, the piston being always pressed down with the thumb acting against the index and middle fingers. The injection material is perfectly fluid at 90° to 100° F., and a higher temperature was never employed. The kidney was suspended in water of about the temperature of the body for some time before the injection, which was slowly and carefully made. I have not thought it necessary to use the method of constant pressure. My results with normal kidneys show that the method employed can be depended on, and as in every case the injection ran with the greatest facility, the pressure

used was always moderate. After the injection was completed the kidney was cooled, so that the gelatine might solidify, and was then cut into small pieces and put into alcohol to harden. In normal kidneys the whole of the vessels are injected—arteries, Malpighian vessels, capillaries, veins.

I have hitherto employed this method in nine cases of Bright's disease, and as these represent a considerable variety of forms and stages, I shall for convenience divide them into groups. We have here to do with the state of the vessels, and I shall therefore arrange the groups on this basis. In the first group, the capillary circulation was considerably obstructed by pressure originating outside the vascular system, and to this group belong two cases of acute tubal nephritis (Cases I. and II.), one case of subacute interstitial nephritis (Case III.), and two cases of advanced interstitial nephritis (Cases IV. and V.), the cirrhotic kidney. In all of these there was very great effusion of the injection material from the Malpighian tufts into the urinary tubules. To the second group belong cases in which there was obstruction of the capillaries, but also to a very great extent of the Malpighian vessels. Of this I have only one instance, but it is a very typical one, a case of interstitial nephritis, with advanced amyloid degeneration. (Case VI.) In the third group neither capillaries nor Malpighian tufts are much obstructed, although sometimes the capillaries and even the tufts are partially so. There are cases of parenchymatous nephritis in which the disease has become chronic, and the kidneys had returned to the normal size or were reduced below the normal. In two out of these three cases there was some slight interstitial nephritis, but it was quite insignificant, and there was either no or very little escape of injection material from the tufts. (Cases VII., VIII., and IX.)

I insert here a brief abstract of each of these nine cases. The clinical history is often imperfect, but the pathological condition has been very carefully investigated in all of them. The kidneys were always examined fresh, and portions of them afterwards hardened with a view to making more

perfect sections. In every case some parts were put in alcohol, and some in a solution of chromic acid, and sections made from each. The injected kidneys were also examined fresh and after hardening in alcohol. The following are the cases:—

Case I. J. W., aged 21, a puddler, had scarlet fever about five weeks before death. About three weeks after the fever the urine became scanty, and soon the legs began to swell, and cough and spit developed. The urine was highly albuminous. *Post-mortem* examination showed the existence of pleurisy, with effusion on right side, and hepatisation of the upper lobe of the left lung. Both kidneys were much enlarged and pale. Microscopic examination, in the recent state, showed general cloudy swelling of the epithelium of the cortical substance, with very great proliferation of these cells and dilatation of the tubules. There was throughout the cortex a tendency to fatty degeneration, which occurred in some parts in distinct patches. Some of the tubules of the pyramids also contained fatty epithelium. In the injected kidney *the capillaries contained very little carmine injection material, but there was extensive effusion into the convoluted tubules of the cortex. The Malpighian tufts were generally well injected.*

Case II. C. G., aged 32, a collier, complained during life of cough and shortness of breath. He had been ill two or three months, and had noticed swelling of the feet and legs about three weeks. The urine was albuminous. On *post-mortem* examination there was extensive effusion into the right pleura, and to a less degree into left. The right lung was carnified, and the left oedematous. The kidneys were enlarged and pale, the left weighing 8 oz. On microscopic examination, very marked general cloudy swelling of the epithelium in cortex was discovered, with a trace of fatty degeneration, but only a trace. There was no interstitial infiltration. In the injected right kidney, *the capillaries were moderately injected, and there was considerable effusion into the convoluted tubules of the cortex. The Malpighian tufts were fully injected.*

Case III. John C., engineer, aged 49, admitted May 10, 1875. Dropsical swelling, attributed to cold twelve months before admission. On admission evidences of pleurisy, bronchitis, and anæmia. Urine was albuminous and contained abundant pus corpuscles, but no tube-casts. Improvement for several weeks while in hospital. Sudden evidences of pericarditis with effusion, and great dyspnœa. Death in a few days. On *post-mortem* examination there was pericardial effusion, enlargement of heart ($20\frac{1}{2}$ oz.), and extensive pleurisy of the right side. The kidneys were nearly normal in size (6 oz.), but the cortex pale and indefinitely marked. The capsule was somewhat adherent. On microscopic examination, very considerable formation of round cells, which were in many parts grouped in considerable masses, but confined to the cortical substance. There was also a general granular condition of the epithelium, but only traces of fatty degeneration. Sclerosis of Malpighian bodies, but not very frequent, especially at deeper parts of cortex. Abundant tube-casts. In injected kidney, *occasional bulky effusion into tubules, but in addition very considerable diffusion among round cells.* Capillaries irregular in outline.

Case IV. Margaret M., aged 37, stated that she had been in good health till October, 1873, when she had an attack of sickness and vomiting, which lasted a fortnight. In January, 1874, the legs and abdomen began to swell, and there was frequent micturition. She was admitted to hospital on June 4th, and complained of cedema of eyelids and feet, frontal headache, noises in ears, dimness of vision, great drowsiness and occasional sickness after food. Uremic symptoms appeared on June 30th, and continued up till death on July 1st, which took place during a convulsion. While in hospital the urine contained abundant albumen, had an average specific gravity of 1010, and deposited granular and hyaline casts. On *post-mortem* examination, the lungs were found adherent and the pleura thickened, but without any recent inflammation. The kidneys were much contracted and granular on surface. They weighed four ounces each. The cortical substance was much reduced

in thickness, averaging only one-eighth of an inch. Microscopic examination revealed very extensive interstitial infiltration of round cells. There was complete collapse and sclerosis of many Malpighian tufts. In the injected kidney *the collapsed Malpighian capsules were entirely uninjected, but there was complete injection of nearly an equal number of almost unaltered Malpighian tufts, and partial injection of a very small number. There was very marked effusion into the tubules. The capillaries very partially injected, and hardly at all where interstitial infiltration was abundant.*

Case V. John T., aged 55, a coachmaker. There was a very incomplete history of phthisis of three months' duration. After death there were found a few small cavities in the lungs, along with pretty abundant condensation. The condensed portions were of a dark grey colour, and generally in the form of concentrically grouped nodules. The kidneys were small, and the surface very irregular. The cortex was reduced in thickness to one-eighth of an inch. The capsule was not very firmly adherent. Microscopic examination showed pretty considerable interstitial infiltration of round cells, with thickening and fibrillation of the Malpighian capsules, but only rarely a complete condensation of the capsules. In the injected kidneys *the tufts were generally pretty well injected, but the capillaries only slightly. There was very considerable escape into the convoluted tubules.*

Case VI. Maria M., aged 31, had cough for six years and diarrhoea at intervals for three. For six months there was frequent micturition. On admission, puffiness of eyelids and œdema of legs existed, and evidences of phthisis pulmonalis were discovered. After admission drowsiness developed and convulsive movements of the arms, with headache and difficulty of articulation. She became almost comatose before death. After death there was found condensation of both lungs, with a large cavity at the apex of the left. The left kidney weighed $3\frac{1}{2}$ and the right 3 ounces. The cortex was only one-eighth of an inch in thickness. The surface was irregular, and the capsule adherent. On microscopic examination there was found very extensive interstitial in-

filtration of round cells in the cortical substance, with almost complete destruction of the tubules. The Malpighian capsules were close together from the general contraction. They were partly condensed and sclerotic, and in great part amyloid, the straight vessels of the pyramids being also amyloid. In the injected kidney *the amyloid Malpighian bodies were very partially injected, in most a single loop or two, while the condensed ones were quite empty. The capillaries were very slightly injected, and there was almost no escape into the tubules.*

Case VII. Samuel V., aged 34. The origin of his illness was referred to a date 14 months before death. He was driver of a mail-gig, and one misty night he drove over a precipice, and lay during a keen frost for three hours before assistance was procured. Five days after, the feet began to swell. He had been in perfect health before. Dyspnoea and cough were present during life. The urine at the time of admission was loaded with albumen, and diminished in quantity. On *post-mortem* examination there was marked œdema of both upper and lower limbs, and a large amount of fluid in the abdomen. The heart was enlarged, weighing 15½ ounces, the left ventricle predominating. The kidneys were nearly normal in size, weighing 6 ounces each. They were rather pale, but smooth on the surface. Opaque markings were visible on the surface and section. Microscopic examination revealed extensive fatty degeneration and proliferation of the epithelium. In the injected kidney *the capillaries and Malpighian tufts were fully injected, and there was scarcely any escape into the urinary tubules.*

Case VIII. John N., aged 68, a bookbinder, was ill for three years with dyspnoea, and swelling of feet for last six months. During his residence in hospital he had repeated attacks of dyspnoea, and the heart's area of dulness was much enlarged. The urine was albuminous and contained granular casts. The patient gradually sank; there were no convulsions. On *post-mortem* examination the heart was found enlarged, weighing 18¾ ounces, the enlargement being chiefly of the left ventricle. The lungs were œdematous,

The kidneys weighed $4\frac{1}{2}$ ounces each, and the cortex was much reduced in thickness and pale. The capsule was adherent and the surface granular. On microscopic examination the epithelium of the cortical substance was generally granular or fatty, with considerable proliferation. There was here and there limited interstitial formation of round cells, but this by no means general. The Malpighian tufts occasionally collapsed. In the injected kidney *the Malpighian tufts were for the most part fully injected, only a few partially so, or completely uninjected. The capillaries were pretty fully injected, and there was a limited escape into the urinary tubules.*

Case IX. David Muir, aged 35, engineer, admitted April 13, 1875. There was history of chronic Bright's disease, with dropsy during the last ten weeks. Erysipelas of legs and sloughing. Cardiac dulness much increased. Urine albuminous and with tube-casts. On *post-mortem* examination, large pericardial effusion, with abundant lymph. Heart enormous ($25\frac{3}{4}$ ounces). Recent pleurisy on both sides. Kidneys nearly normal in size ($5\frac{1}{4}$ ounces). Surface red, slightly irregular, capsule non-adherent. On section irregularity of cortical substance. Abundant fatty degeneration of renal epithelium, and contortion of the tubules observed on microscopic examination. There is very little interstitial new-formation, but occasionally a small group of round cells. On the other hand there was frequent collapse of tubules, which rendered the interstitial substance unduly prominent. In injected specimen, *there was no bulky effusion into tubules, but considerable diffusion into interstitial substance, especially where there were round cells. Also occasional escape into tubules, but in small quantity.*

If we now consider more closely these several groups and their components, we shall find some facts worthy of attention. The first group includes cases in which the capillary blood-vessels are obstructed. In the two cases of acute parenchymatous nephritis, the kidneys were much enlarged and pale, the kidneys in one of them weighing 8 ounces each. Microscopic examination showed that this enlargement was due

to changes in the epithelium, which was granular or fatty, and in a state of proliferation in the cortical substance. In one of these, which was a case of scarlatinal nephritis, the proliferation was very marked, the tubes being in many parts distended, with a collection of small epithelial cells. This great distension of the tubules would necessarily produce obstruction of the capillaries by direct pressure on them, and in the scarlatinal case we find that these are hardly at all injected, while in the other case they are much less filled than in the normal kidney. We are, therefore, not surprised to find that the injection in both these cases has passed greatly into the urinary tubules. It may be remarked here that it is, as a rule, not difficult to distinguish whether the injection has issued from the Malpighian tufts into the tubules, or has found its way thither by some other way; for in the former case it is bulky and distends the tubules; it also occupies considerable lengths of tubules, and these are always of the convoluted form. These observations at once suggest the hæmaturia which is met with in acute Bright's disease, and seem to indicate that we are not to ascribe that condition to a general congestion of the kidneys, but rather an obstructive anæmia of one set of vessels, with consequent hyperæmia and increase of pressure in others. We are led to associate the hæmaturia and also the albuminuria with the increase of pressure in the Malpighian tufts.

In the case of sub-acute interstitial nephritis, there was a very bulky exudation of round cells, confined to the cortical substance of the kidney, and chiefly in the deeper parts of it. This was so abundant that sometimes the tissue resembled granulation tissue. The kidneys were normal in size, and there was only occasional sclerosis of the Malpighian tufts. Here again we have capillary obstruction. The injection has in many cases run in among the round cells in these collections, but there is rarely any proper capillary injected. But the injection has run in considerable quantity into the tubules, and has evidently escaped from the Malpighian tufts. It is noteworthy that in this case the urine, during life, contained abundant round cells

presenting all the characters of pus corpuscles, evidently the round cells so abundant in the kidney. No tube-casts were found in the urine, although they existed in large numbers in the kidneys.

In the other two cases belonging to this group there is again very great obstruction of the capillaries. These are cases of cirrhotic kidney, the kidneys being small and granular on the surface. The tubes in both these kidneys are in great part destroyed, and in the injected specimens it is seen that the capillaries are very imperfectly injected. Although the capillaries are evidently much obstructed, there is in many parts considerable diffusion of the injection materials among the round cells which occasionally are present in large numbers. A large number of the Malpighian bodies are collapsed and sclerotic in one of the cases, and a smaller number in the other, but in both there are a considerable number in which the vessels of the tufts are fully injected. In both there is very considerable escape of the material into the urinary tubules, and there is thus produced a bulky injection of the tubules. In fact, it is obvious from these injections, that though many tubules are destroyed, yet those which remain are considerably dilated and contorted, so much dilated indeed as to give, to some extent, the appearance of cysts filled with red material. Here again it is obvious that we have an obstruction of the capillaries, and an increased pressure thrown on the vessels of the Malpighian tufts, with the result that these have become pervious for the injection material, and pervious during life doubtless for the blood plasma. In this reference the occasional existence of hæmaturia in advanced Bright's disease is of interest. We can readily suppose that sometimes the interruption of the circulation will be such as to lead to the escape of blood from the Malpighian tufts. I have specimens in my possession in which blood exists in considerable quantity in the tubules, in a case of interstitial nephritis with considerable sclerosis of the Malpighian capsules. In this case, as in others, the blood is mostly in the convoluted tubules, this being evidence of its probable origin from the tufts.

We now turn to the second class of cases, those in which both the capillaries and the Malpighian vessels are in great part obstructed. This is represented by one case of interstitial nephritis with advanced amyloid degeneration, occurring in a case of phthisis. There is here great interference with the circulation in the cortex of the kidneys, the presence of abundant round cells with some cicatricial contraction has produced great destruction of the renal tubules, and great interference with the capillaries. At the same time the Malpighian vessels are attacked in two ways. The interstitial affection is accompanied as in other cases with sclerosis and condensation of the Malpighian bodies, but those not so affected are almost all amyloid. And the amyloid degeneration has produced the usual effect of narrowing and finally obstructing the calibre of the vessels. The consequence is that there is hardly a Malpighian tuft which is fully injected. The amyloid ones have at most a loop or two of vessel with the injection material in it, while the sclerotic ones are mostly empty. The capillaries are very slightly injected, and there is almost no escape of the material into the tubules. This result is just what we should expect from the kind of lesion found. The albuminuria which exists in this and in similar cases is presumably due to transudation through the altered vessel walls. There may possibly be localised increase of pressure, but we know that fluid passes more readily through the walls of amyloid than normal vessels.

In the next group we have three cases of chronic Bright's disease, in which that disease is mainly if not entirely tubal. The affection has in these cases passed beyond the stage of enlargement, the epithelium has become fatty, and been to some extent discharged, while the new-formation has not been active enough to keep up the distension of the tubules which exists in the acute stage. In the three cases the kidneys were doubtless at one time large. But in two of them they were now of about the normal size, and in the third considerably under the normal, ($4\frac{1}{2}$ oz.) In all of them the heart was enlarged, weighing $15\frac{1}{2}$, $18\frac{3}{4}$, and $25\frac{3}{4}$ oz. In all of them

there was abundant fatty degeneration of the epithelium with evidences of proliferation. In two there was some little interstitial new formation, and some sclerosis of the Malpighian tufts, but to a very slight extent. It appears, therefore, that in these cases any pressure on the capillaries, which at one time existed, has been relieved, and we find in the injected specimens, as a matter of fact, that the capillaries are well injected. In one of these, indeed, the injection is just as good as we find in the best injected normal kidney, and in the others it is not far behind. In accordance with this there is scarcely any escape into the tubules, and where it does exist it has not that bulky continuous character which we see in the cases already considered, where it presumably arises from escape through the vessels of the tufts. But in these cases a condition presents itself, which is indeed present in some of the others, but not usually to such an extent. The injection has diffused to some extent out of the vessels, and in certain cases seems to have generally infiltrated the tissue of the kidney, and in part passed into the tubules. We may suppose that in these cases the tubules being irregularly collapsed, and the epithelium in certain parts lost, the vessels will no longer be fully supported, will be contorted and unequally pressed on. It may be possible in this way to explain the diffusion of the injection in these cases, and in this way also the albuminuria during life may be perhaps accounted for.

It seems natural to look on hæmaturia and albuminuria as phenomena of similar import. A high degree of pressure will produce ruptures of the vessels sufficient to allow the passage of blood-corpuscles, while a less degree will so distend them as to let through the fluid. It is interesting to observe that in the parenchymatous form of Bright's disease it is in the acute stage that hæmaturia is a prominent sign, and the results of injection indicate a special increase of pressure in the Malpighian tufts in this stage. In the chronic stage, where blood is much less common, there is almost no escape of injection from the tufts, but rather evidence of a soakage of the blood-plasma through the

tissues into the tubules. On the other hand, in chronic interstitial nephritis, where there is great interference with the capillaries, we have again indications of pressure in the vessels of the tufts, and the albuminuria may be accounted for in this way. It is possible also that the increase in the quantity of urine in chronic interstitial nephritis may have something to do with the increased pressure in the vessels of the Malpighian tufts. The increase of pressure will lead to increased transudation, and the capillaries and epithelium of the tubules being in great part destroyed, there will be very little subsequent concentration of the urine, which, according to Ludwig, takes place after the fluid has passed from the tufts into the tubules. In strict accordance with this is the low specific gravity of the urine in these cases. The fluid which filters through the Malpighian vessels is a watery fluid, and under normal conditions is concentrated, but these conditions being absent it will remain watery.

V.—PATHOLOGICAL RECORD.

By DAVID FOULIS, M.D., *Pathologist, Glasgow Royal Infirmary.*

I.—FRACTURE OF COSTAL CARTILAGES—RUPTURE OF HEART—
OMENTAL HERNIA.

THE object of the following notes is to give to the readers of the *Journal* short notices of the more interesting cases which come under observation in the Infirmary *post-mortem* room, and more particularly of such cases as furnish additions to the Museum. The specimens described may therefore be inspected by anyone who may be interested in seeing them, and every facility will be given for this purpose.*

* It seems appropriate here to invite the co-operation of gentlemen who, from past association with the Infirmary or otherwise, may be inclined to sympathise with its advancement as a centre of clinical and pathological observation, in the task of adding to and rendering more instructive the excellent but modest museum which it contains. All specimens of calculi, tumors, morbid products, or anatomical specimens of any sort, will be carefully put up and catalogued, with names of donors, etc., if sent to the address of the Curator, Glasgow Royal Infirmary; and in this way not only will the specimens so sent be made accessible to students and others, but they will be permanently preserved from being lost or forgotten, which would probably be their ultimate fate in a private collection.

(1.)* *Fracture of Costal Cartilages*—Two Cases.—(Mus. Prep. ii., 152 and 154).—The first case was that of a gatekeeper, K. M.K., aged 49, admitted May 27th, 1875, under Dr Scott Orr's care, with "œdema of legs, of three weeks' duration; and with a history of occasional anasarca, orthopnoea, and dyspnoea. There was a constant A.S. murmur, and a variable V.S. ditto; no enlargement of hepatic or cardiac dulness. Death was ushered in by pulmonary œdema, cold extremities, etc., and occurred on June 27th, at 12.10 a.m."

At the autopsy the body was large and well developed; there was œdema of legs and chest wall; considerable ascites; 50 oz. of fluid in right pleura. The heart weighed 24 oz.; no contraction of any valvular orifice; the right A.V. opening rather dilated; edges of the A.V. valves on both sides thickened. Right lung bound down by old fibrous adhesions, and firmly compressed and rendered non-crepitant by the fluid in the pleura; left lung rather expanded, if anything; emphysematous at margin; scarcely any fluid in left pleura, in which a few small unimportant bands of fibrous adhesion existed. Liver weighed 2 lbs. 8 oz.; left lobe atrophied; lobules dark with yellow margins. Some patches of semicartilaginous thickening at lower end of aorta. Other internal organs presented nothing remarkable. On the left side of chest wall a depression in the neighbourhood of the seventh and eighth costal cartilages, which are found to be fractured about one inch from the attachment of the ribs. The outer (costal) fragments are pushed in behind the inner (sternal) fragments for a distance of half an inch. The eighth and ninth ribs are fractured half an inch from the junction with the cartilage, but here there is no great displacement. The tenth rib also depressed at its end, the tip of the cartilage projecting outwards and rather upwards, but no trace of fracture. More minutely examined, the fracture of the costal cartilages is seen to present on section the appearance given in Fig. 1. The two ends of the cartilages overlap

* I am indebted to the kindness of the physicians and surgeons of the Infirmary for the notes of the clinical history of the cases which precede the pathological accounts.

each other. The cartilage in its substance shows no trace of calcification, but a striated silvery mottling, as of fine fibrous tissue inserted in the cartilage. Between the cartilages, where they overlap, there is a thin layer of cancellated bone, which is in contact directly with the cartilage on one side, while on the other a layer of matted fibrous structure, seemingly the remains of torn perichondrium, intervenes between it and the cartilage, as shown in Fig. 4. The cartilage substance near this fibrous structure is demarcated off into unevenlooking areas, enclosing the cell groups. At the ends of the cartilage the perichondrium has formed a bridge over the angular space (Fig. 1), and this space is occupied by a reticulum of bone. The relations of this bony deposit to the perichondrium and to the unaltered fracture-face of the cartilage are shown in Figs. 3 and 2, the line of demarcation in either case being sharp and clear. There is no redundant bone, so much only being produced as suffices to form a padding between the ends of the cartilages and under the perichondrium. How long before death the fracture may have occurred we have no means of ascertaining; the history of the patient only indicating that he had been a sailor in early youth, and subsequently a soldier. Patient never referred to the fracture in his statement, and the deformity being slight, he was not minutely questioned as to its origin: it being regarded as an obsolete injury foreign to the disease then under investigation. The second case came into the *post-mortem* room ten days after the first.

J. D., aged 27, cleaner, admitted August 5. Had fallen from a fourth storey; died August 6.

DESCRIPTION OF PLATE.

- FIG. 1.—Section of union by means of cancellated bone of two fragments of fractured costal cartilage, and showing disposition of the bone. Nat. size.
- FIG. 2.—Section showing junction of the fracture-face of the cartilage with the cancellated bone, as seen under power of 280 diam. (Decalcified.)
- FIG. 3.—Section showing the bridge of perichondrium closely applied to the padding of cancellated bone, as seen under power of 280 diam. (Decalcified.)
- FIG. 4.—Section showing the remains of perichondrium intervening between the cartilage and the bone where the cartilage ends override, as seen under power of 280 diam. (Decalcified.)

IV

II

I

III

FRACTURE OF COSTAL CARTILAGES

Body (examined on August 9) plump; rigor mortis well marked in legs, less so in arms; abdomen tympanitic; surface of body livid, especially along the lines of superficial veins. A livid bruise on right ankle; on scalp over left parietal a lacerated cut $1\frac{1}{2}$ inches long, but no fracture of skull. Heart 8 oz., flabby, stained internally; the right pleural cavity full of gas; the right lung compressed, non-crepitant, bound down by old adhesions, its anterior margin slightly lacerated; no fracture of ribs on right side; left lung crepitant throughout, except a small part at the back; liver and kidneys fatty; brain 37 oz., at lower part of right frontal lobe a yellow patch as if bruised; spleen very soft and pulpy. Left femur has sustained two simple fractures, one through the middle third and one through the neck; right tibia at its lower end starred and splintered (Mus. Prep. ii., 156); tuberosity of right os calcis bruised; no wound of skin. The eighth left costal cartilage fractured near its junction with the seventh. The fracture is transverse to long axis of the cartilage; perichondrium not ruptured; very little displacement; no extravasation of blood or other matters at or near the fracture.

These two cases illustrate well the pathology of fracture of the costal cartilage, a rare form of injury. Both of the cases were in comparatively young people; in neither was there any calcification of the costal cartilages, such as would render them more brittle than usual; and both must have been due to extreme external violence, as the concomitant fractures in other parts of the same bodies testify. The site of the fracture in both cases is noteworthy, being that in which these fractures are usually found, namely, the fifth to eighth cartilages, which, from their length, are apt to be broken. The union which occurred in the first case, by interposition of a layer of true bone, is the usual but not invariable mode of union in these fractures. Malgaigne* informs us that in experiments upon young dogs he found, after fifty days, a fibrous or fibro-cartilaginous union of the

* Malgaigne, *Traité des Fractures et des Luxations*. Paris. 1847, t. i. p. 443.

ends; and in Holmes' "System of Surgery,"* notice is taken of one preparation in St. Bartholomew's Museum (iii. 4), where pure cartilage unites the fragments, and of another (iii. 48) where the uniting medium is partly bone and partly cartilage. The source of the cementing bone appears to be the perichondrium. Hamilton† quotes Paget to the effect that the cartilage in the vicinity of the bony deposit also undergoes ossification; but in the case above detailed this had not taken place, the limits of the cartilage being clearly demarcated. The only part of the cartilage which had undergone any appreciable change was that shewn in Fig. 4, where the cartilage substance is vaguely marked out into irregular areas, not suggestive of bony deposit.

(II.) *Rupture of Heart.* 1 Case. (Mus. Prep. iii., 128). W. D., aged 47, labourer, admitted May 31, 1875, under care of Dr McLaren. Had been found by the police near some brick kilns, where he had seemingly lain during the previous night: a history of intemperance.

"When admitted patient was insensible, livid, pupils dilated, pulse slow and feeble, body cold. After admission the lividity diminished; half an hour after admission a slight convulsive fit occurred, characterised by twitching of muscles on right side of face and body, dragging of mouth to right side, closure of right eye; left eye open; left side of body and face motionless. This lasted for three minutes, after which the twitching ceased for about ten minutes, when another fit of similar character occurred. No frothing at mouth; no vomiting. After the second fit, the sensibility of the right side to impressions seemed lessened, but afterwards rose again. Under restoratives, the lividity became less marked, the body became warmer, the pulse improved; no temperatures were taken. At the evening visit patient was semi-comatose, freely perspiring, pulse 120, breathing more easy, pupils dilated, heart action irregular. The urine was examined: sp. gr. 1025; no albumen. June 1. Con-

* Vol. ii., p. 561.

† Hamilton. *Treatise on Fractures.* Philadelphia, 1860, p. 179.

tinued in much the same state; a very partial return of consciousness proved transient. June 2. In same state, but more restless and feverish. June 3. Death at twelve noon, without being preceded by any marked change in the symptoms."

Autopsy.—Body emaciated; no signs of external violence; on opening chest the pericardium was found to contain 10 ounces of dark partially clotted blood, part of the clot having the form of a thin red sheet. After carefully removing the clot and cleaning out the pericardium, a search was made for the possible source of the blood. Along the left side of the septum ventriculorum there ran a slit $\frac{1}{2}$ -inch long, the edges of which were slightly inverted and loosely cemented by fibrin, and on gently passing the probe into this it was found to enter the left ventricle. The thoracic viscera were now removed *en masse* from the chest, and examined in detail. The wall of the left ventricle of the somewhat enlarged heart was thickened, its tissue rather soft, and with a faintly orange-red hue.

The heart as a whole flaccid; the cavities not dilated abnormally; the only valve which was diseased was the aortic valve, the segments of which were the seat of nodular thickenings and calcareous degeneration. The whole of the arch of the aorta much dilated, and lined in its interior by plates and coralline limy incrustations; near the orifices of coronary arteries two smaller bulging dilatations. At the third dorsal vertebra the dilated arch had seemingly become adherent to the bone, and its wall destroyed, for here there was a limited superficial patch of erosion of the vertebra, $\frac{1}{2}$ -inch in diameter. The aorta downwards from the fourth dorsal vertebra was not dilated, but was lined by calcareous plates down to the bifurcation: it contained throughout dark clotted blood, with a small amount of decolorised clot in the dilated arch. In the pulmonary artery there was a mingled white and dark red clot which, when pulled out, presented a complete cast of the branches of the artery down to the smallest twigs (Mus. prep. iii., 127).

Lungs adherent at apices, upper lobe of right lung coated

with recent lymph, and the seat of grey hepatisation; apex of left lung puckered by old disease, the nature of which cannot be accurately defined. Liver highly cirrhotic, weight 3lbs. Kidneys shew several infarcts, of dark red or yellow colour, and indistinctly marbled. In brain two infarctic areas, one size of a pigeon's egg, in right hemisphere, abutting on the surface opposite optic thalamus, and a small one of size of a horse bean at anterior part of left corpus striatum; the tissue of these is soft, yellowish, dotted with red points, which in places give almost a purple hue. The larger of these areas had corresponding to it a localised serous subarachnoid effusion.

The cause of death here seems indisputably to have been rupture of the left ventricle from overstrain. There was not the least appearance of any rupture of any vessel, and the presence of the slit at the side of the septum ventriculorum leads to the conclusion that the heart, overburdened by the work of propelling the blood into and past the aneurismal dilatation of the arch of the aorta, had given way, possibly under the extra strain of some passing exertion. The microscopical examination of the tissue of the heart shewed a granular condition of some of the fibres. The granules were large, and disposed in groups in the middle of the muscular fibres, probably the result of myocarditis set up by the exaggeration of function called for by the state of the aorta. Death in this case did not occur for at least four days after the advent of the state of insensibility, which we may well assume to have been contemporaneous with the rupture of the ventricle. The partially occluded condition of the slit in the heart, and its small extent, may have favoured the continuance of life for a few days, the amount of blood oozing out at each pulsation being extremely small. The observations which, in the helpless state of the patient, could be made as to the state of sensation on the left side were unfortunately too meagre to allow of generalisation: but the undoubted fact of motor paralysis of the left side may be taken in connection with the presence of an infarct destroying the substance of the brain on the right side, in the

immediate vicinity of the fissure of Rolando; and this may be read along with the results of Professor Ferrier's experiments, which shew a relation to exist between the grey matter of this part of the brain and the motor power of the opposed side of the body.*

(III). *Omental Hernia*. 1 Case. (Mus. prep. V. 145). T. S., aged 44, under care of Dr E. Watson, admitted April 6, 1875, with an old hernia (inguinalis sinistra), which for two days back had not been reduced; vomiting. The bowels were moved by enemata and purgative medicine; and although taxis failed, yet the state of patient improved so far as to render immediate operation unnecessary. A month afterwards circumstances induced a renewed attempt at taxis, which proved unsuccessful, and as operative measures seemed to afford the best chance of permanent relief, the hernia was operated on on May 11. On opening the hernia sac it was found firmly adherent to a smooth hard mass, and considerable difficulty was experienced in separating the one from the other. When this was accomplished the contents of the sac were seen to be a pear-shaped mass, smooth, hard, and injected, with almost no fluid around it. There was no bowel protruding, and on further examining the mass above alluded to, it was found so very solid and consistent that it was determined to return it. This practice was rather decided on from the old standing nature of the protrusion, and Dr Watson explained his opinion to be that this tumour was omental and of very old standing, so that it had become thoroughly glued together. He also believed that a knuckle of bowel had occasionally come down along its neck and been returned. Peritonitis, which had frequently existed in the previous history of the case, again attacked him, along with inflammation of the scrotum, and patient ultimately succumbed on May 18. The senses were clear to the last, and there was no decided abdominal pain. On opening the abdomen the intestines were found matted together by yellowish grey lymph, the uncovered surfaces of the gut presenting an injected aspect. When the soft adhesions between the

* Brit. Med. Journal, Aug. 28, 1875. p. 277.

intestinal coils, and between these and the abdominal wall were separated, the great omentum was found to have become twisted into a smooth round solid rope, 8 inches in length, and 1 to $1\frac{1}{2}$ inches in diameter. This rope was attached at its upper end to the left part of the transverse colon, and ended below in a free pear-shaped knob, which had formed the contents of the sac. The free end was lobulated, coated with soft lymph, and displayed several areas of injection. The track of the hernia glued up by lymph; the scrotal sac lined by a grey thickened membrane, and the left side of scrotum generally inflamed and sloughing, with an abscess in the tissues of the spermatic cord. Heart 12 ounces: nothing specially noteworthy in its structure; interior of aorta showed patches of endarteritis chronica. Lungs highly emphysematous. Left kidney weighed 10 ounces; capsule easily removed; substance of kidney rather congested. Right kidney exceedingly small, firmly embedded in a mass of adipose tissue from which it could not be separated; measured 2 inches by 1 inch. There was a small residue of firm, hard tubular structure, but the greater part was occupied by cysts full of soft white pultaceous matter, which also occupied and distended the ureter. Liver 3 lbs. 7 oz., highly fatty; tissue friable and greasy to the feel; colour yellow brown. Spleen soft, adherent, could not be removed without laceration. Brain normal.

Among other points of interest in this case the state of the omentum deserves notice. The web of the great omentum becomes drawn in towards the left part of the transverse colon exactly as if it had been drawn through a ring at this point. It assumes the form of a solid rope at a distance of half-an-inch from the bowel, being at its upper extremity rather flattened from before backwards; and soon becoming round and smooth it maintains an equal thickness of $1\frac{1}{2}$ inches down to the knob at the free end, where it swells out into the pyriform lobular mass formerly noticed. It is throughout covered with smooth peritoneum: and on section it displays a firm adipose tissue intersected with fibrous septa.

Death seems to have resulted from the recurrence in a

severe form of a previously intermittent peritonitis, aided by the serotal inflammation: and was no doubt also not quite unconnected with the state of the kidneys which the *post-mortem* examination revealed. The discrepancy in the relative sizes of the kidneys affords a good example of enlargement of one of a pair of organs to compensate for the well-nigh obliterated state of the other.

VI.—REPORT OF THREE CASES OF PERITONITIS ASSOCIATED WITH
CARDIAC AND RENAL DISEASE,

By DR FINLAYSON, Physician to the Glasgow Western Infirmary.

PERITONEAL friction is not very often felt or heard in a distinct manner, but, when present, it may reveal the existence of peritonitis in a stage or form otherwise liable to escape our notice. This happened in the two first cases here given; in the one the friction appeared for a few days only, about a week before death; in the other it was only detected on the last day of life. In the first, the nature of the friction was quite clear during life, and it was verified after death. The report on May 20 (a week before death) was as follows:—"The liver can still be felt enlarged and indurated; to-day, for the first time, on examining in this region, distinct crackling or grating could be felt during the respiratory movements, or upon moving the hand; and with the stethoscope distinct friction sounds corresponding with this. This sensation of grating is limited to the region of the liver, and is especially noticeable just below the xiphoid; it does not extend below this, and seems to be due, not to anything in the cellular tissue, but to some roughness of the peritoneum, or to effusion of lymph between the parietal peritoneum and liver." This was exactly confirmed at the dissection, and its detection was the more striking as the peritoneal cavity contained, as will be noticed in the detailed report, a large quantity of fluid. In the second case the sensation was equally distinctive, and resembled the above so closely, that no doubt could be entertained of a similar

condition being present, although, unfortunately, no inspection could be obtained.

[During last winter two other cases of peritoneal friction were brought under the notice of the clinical students, the one in Dr Gairdner's wards, and the other under my own care. There was good reason to believe that both of these were cases of chronic tubercular peritonitis. In both there had been a large effusion of fluid into the peritoneum.]

With regard to the association of diseases in the three cases here given, it may be said that in the whole three the heart was seriously affected. The *first* was essentially a case of nephritis, complicated with hypertrophy of the left ventricle of the heart, dropsy, congestion of the liver, erysipelas, peritonitis, and pericarditis. The *second* was a rheumatic case, with probably some affection of the pericardium, certainly with mitral valvular disease and much hypertrophy, congestion of both lungs, and pleurisy on the right side; the urine, which was not albuminous on admission, became slightly so a week before death, and on the day on which the peritoneal friction was felt, just before death, it was loaded with albumen and tube-casts.

The *third* case was a much more obscure one in its pathology; during life profound anaemia, which could not be explained, was the most prominent fact; signs of endocardial and pericardial disease likewise were made out, and it was suspected that fatty degeneration might be going on in the viscera, as has been so frequently observed in cases of pernicious anaemia. The *post-mortem* examination confirmed all this, but revealed, in addition to valvular lesions and adherent pericardium, old standing peritoneal adhesions; no evidence of tubercular disease could be discovered either there or in the lungs or other organs.

The two first cases fall well enough within the recognised category of acute peritonitis due to renal disease; and in the first, the coincidence of the peritonitis with erysipelas and pericarditis is very striking. The third case may illustrate an allied tendency to low forms of peritonitis and pericarditis, due to the profound anaemia and depressed

vitality of the patient. Of course it is just possible that the peritonitis was really of a tubercular character, and that the pericarditis was traceable to an old and obscure rheumatic illness; but there are strong points in the case, as given, against such a supposition.

CASE I.—*Obscure account of former disease of the liver and of gout; For five months affection of the kidneys with dropsy; sloughing ulcers of the limbs and ascites; Cardiac and pulmonary complications; Tapping; Disappearance for a time of albuminuria; Erysipelas; Increase of dropsy; Peritoneal friction; Pericarditis; Death; P. M.; Parenchymatous nephritis; Recent pericarditis; hypertrophy of left ventricle of heart; Pleuritic effusions and pulmonary congestion; Recent lymph on surface of liver; Liver enlarged and with nutmeg appearance.*

Archibald M'L., aged 52, boatman, was admitted to Western Infirmary, on April 9th, 1875. He had been in the habit of using stimulants freely, and sometimes no doubt to excess. The illness dated from November, 1874, although there was an obscure account of an inflammation of the liver, and of acute pain with swelling and heat in the feet and great toe, several years before. He had also had a slight paralysis of right side six months before admission. In November last there were pains in the small of the back, scanty and high coloured urine, shortness of breath and palpitation; in two or three months swelling of the lower limbs appeared, and this increased to such an extent that the skin gave way, and ugly sloughs on the legs were found on admission. The physical signs on admission were those of cardiac hypertrophy, with irregular action of the heart, a systolic bruit, and dullness on percussion at the base of the right lung, with crackling râles. The urine on admission was moderately albuminous, sp. gr. 1018, with much pus under the microscope and some tube casts. The liver was found, on careful palpation, to extend two or three inches below the ribs. Some improvement in the state of the ulcerated legs and in respect of the breathlessness and sleeplessness occurred after admission; the bowels, which had been loose, became rather costive. The distension of the abdomen, however, increased

to such an extent that on April 29th, 244 ounces of clear fluid were removed by the aspirator. Some improvement followed the tapping, but paroxysmal cough at times became troublesome. This was relieved to some extent by sedative inhalations. A severe attack of diarrhœa likewise supervened, and the presence of piles aggravated the distress. On May 20, the sores on the legs being quite healed up and scabbed over, it was noted that erysipelas, which had begun a few days before on the nose, was extending to the cheeks, although not assuming any serious aspect. The fluid had accumulated again to some extent in the abdomen, but the enlarged liver could still be felt, and on this day distinct friction with the respiratory movements could be felt by the hand applied over this organ, and corresponding friction sounds were heard through the stethoscope. On May 27th the erysipelas, which had seemed to be arrested, took a fresh start; the friction over the liver could not then be felt, but a very marked pericardial friction sound was now heard for the first time, and he died the following day. The treatment throughout was varied, according to the more urgent symptoms; sedatives by the mouth and by inhalation for the breathlessness, astringents or purgatives for the bowels; tincture of steel when the erysipelas appeared, and diuretics and stimulants more or less throughout.

The urine was reduced in quantity throughout, but accurate measurements were scarcely possible, owing to the restlessness of the patient, and the occurrence of diarrhœa, the quantities noted varied between 20 and 30 ounces, but just before death they were much further reduced. The specific gravity varied but slightly—1012 to 1018. The colour was about normal or even somewhat high. Albumen was present at first in moderate quantities, but about the beginning of May it became very small, and for a few days about this time none could be made out by heat or nitric acid, and it returned only in small quantity afterwards. Even when no albumen could be detected a few tubecasts were found, and these were present more or less throughout; they were chiefly granular. Considerable

quantities of pus were found in the sediment on several occasions.

The *post mortem* examination was made by Dr Coats, on May 30. The pericardium was found to contain an ounce or two of fluid, with shreds of soft lymph, heart $16\frac{3}{4}$ ounces, hypertrophy chiefly of left ventricle, mitral orifice dilated, and the curtain and chordæ tendinæ somewhat thickened. Fluid in both pleuræ, but more in right; both lungs engorged. Peritoneum contained a large quantity of fluid, with here and there shreds of lymph, and more especially over the upper surface of the liver. Liver weighed $4\frac{1}{4}$ lbs., its capsule thickened, and somewhat of the nutmeg appearance on section; microscopically it presented the appearance of intense hyperæmia, and not at all of cirrhosis. The kidneys were small, together 7 ounces, dark red colour on section, the cortical being as dark as the pyramidal portion: several cysts were found. The microscopic appearances were those of parenchymatous inflammation. The peritoneal surface of the colon generally was thickened, and its mucous membrane thickened and slaty in colour.

CASE II.—*First attack of acute rheumatism, 7 months, and a second attack six weeks before admission; Cardiac symptoms and suspected pericarditis; Great hypertrophy of heart and mitral regurgitation; Pleurisy right side; Supervention of albuminuria and peritoneal friction; Death: No inspection.*

Alexander H., aged 20, tinsmith, of temperate habits, was admitted to the Western Infirmary, July 24, 1875. He had had rheumatic fever 7 months ago, since which time he had suffered more or less from pain and palpitation of the heart, and from dyspnoea on exertion. A return of these symptoms had taken place six weeks before admission, and he had been attended by Dr Renfrew, who detected cardiac hypertrophy and systolic bruit; from the extreme dulness in the præcordial region he suspected effusion into the pericardium. He was seen by myself, on one occasion before admission, for Dr Renfrew, but as it was after the præcordial dulness had somewhat diminished, I could not verify the existence of pericardial effusion; great hypertrophy and mitral regurgita-

tion were clearly made out, as also dulness in the right back, probably from pleuritic effusion. As he did not mend much, he was advised to enter the Infirmary. Under treatment considerable improvement in the breathing took place; but the signs noted above continued throughout. There was slight dropsy on admission, but no albuminuria. On August 11th, an obscure trace of albumen was made out in the urine (which was loaded with phosphates and urate of soda), and the following day a distinct trace was discovered. On August 20th, the condition of the patient, which had been obviously worse for a few days, seemed hopeless, the weakness, the breathlessness, and œdema having all increased; the urine now contained albumen in considerable quantity, and the sediment was loaded with tube-casts. The specific gravity had throughout been above normal, and the colour high. On the same day, "for the first time, on applying the hand over the liver, very marked friction could be felt over the whole of hepatic region, and patient complained of some pain on pressing over this region. Liver seemed distinctly enlarged and somewhat prominent; no vomiting." He died the following day. No inspection could be obtained.

CASE III.—*Obscure history of rheumatism 12 years before; Anæmia, weakness, and vomiting, for about 3 months, without obvious cause; Signs of pericarditis and endocarditis without any other discoverable lesions; Pink reaction of urine with nitric acid; Increasing weakness and delirium; Death; P.M.; Adherent pericardium; Thickening of mitral and aortic valves; Thrombus in right auricle; Fibrous adhesions of the intestines; Fatty degeneration of heart.*

John R—, aged 29, letter carrier, was admitted to the Western Infirmary, February 22d, 1875. The leading features in the case were profound anæmia, weakness, and bilious vomiting. He was passed for life insurance four years ago, but he had been falling off since October, 1874; his colour became changed a month or so later; he had continued, however, at work till January 9th; about this time vomiting came on; for three weeks he had been chiefly

in bed, and on admission some oedema of the feet was detected for the first time. No very obvious cause could be discovered for the illness. He was ascertained to have been of temperate habits; he had had "growing pains" at the age of 17, and as some feverishness had existed at this time (called "intermittent"), the illness was probably rheumatic. He had had several attacks of gonorrhœa with bubo, but no evidence of syphilis could be made out. His health had been good till last October, although, during the last four winters he had not felt so well as during the rest of the year. There had been no loss of blood in any way. The skin had a tinge resembling that of a very slight jaundice, and the conjunctivæ seemed a little yellow also, but no biliary reaction with nitric acid could be obtained on testing the urine. The mucous membranes were extremely pale, but beyond the yellowish tinging of the skin and conjunctivæ, no discolouration existed elsewhere. The hepatic dulness was normal, and no tumour or irregularity could be felt in the abdomen, although some undue resistance seemed to be present just to the right of the rectus muscle below the ribs. The præcordial dulness extended about an inch and a half to the right of the middle line, and very slightly to the left of the nipple (measuring $5\frac{1}{2}$ inches). The upper boundary of the dulness was normal. The apex beat was exactly below the nipple in the 5th intercostal space. An undue sense of heaving could be felt over the right ventricle, and this even extended to the epigastrium. All over the præcordial area murmurs accompanied the heart's sounds. At the apex the murmur seemed blowing, and was chiefly systolic, with only a suspicion of murmur after the second sound. At mid-sternum there was a marked double murmur, not always accurately defined as to rhythm, and conveying a suspicion of "rubbing;" at the extreme base both murmurs were also audible, the systolic being the louder; both murmurs were also audible, at times at least, over the right carotid. There was no great muffling of the sounds, and no extension of the dulness towards the manubrium sterni. He complained of no pain anywhere, and there was

no orthopnoea or respiratory distress. There was no enlargement of the spleen, and no glandular enlargements, except to a slight extent in the groin; the blood seemed quite normal as regards the relative number of white corpuscles. Nothing abnormal was found in the lungs. The urine was tested very carefully, but no albumen could be discovered on the first two days of his stay; the colour was rather high; sp. gravity about 1013; quantity about normal; acid to litmus; no biliary reaction with nitric acid; on adding cautiously a little nitric acid a pink zone was formed at the junction of the fluids; and on boiling some urine with about a fourth of its bulk of nitric acid, a deep pink colour was produced on several occasions (Uro-hæmatine of Harley). No blood reaction occurred with the guaiac test. Under the microscope a few white cells were seen, apparently pus corpuscles, but no tube casts. (Uric-acid crystals were subsequently deposited in this sample.) In view of these facts the following was the diagnosis entered on the card:—"Profound anæmia; slight jaundice; pericarditis and endocarditis; obscure history of rheumatism."

The patient only lived five days in hospital; the vomiting of bilious matter continued troublesome; the bowels acted naturally; the temperature was about normal (99 deg. to 100 deg.); pulse rapid (120), and respirations somewhat accelerated (24). The mental condition was variable, the memory was evidently much impaired, and at times he was quite delirious, but at other times he seemed sensible enough; during the last two or three months his temper had been noticed to be more irritable by his fellow workers. On 25th February a minute trace of albumen appeared in the urine, and this continued to be present on the 26th also; the œdema noted on admission had disappeared. The weakness became more extreme, the respiration gasping, and death occurred on the morning of February 27th.

Inspection, 28th February, by Dr Coats. Pericardium adherent in every part, but mostly so at the base; adhesions fibrous; rarely appearance of recent lymph; heart somewhat enlarged; slight thickening of aortic valves, but no great

rigidity (regurgitation supposed to be improbable, but not tested with water); mitral curtain and chordæ tendineæ distinctly thickened; no narrowing of aperture; right auricle contained a thrombus as large as a filbert, attached by two processes, one at auricular appendage, the other at the edge of tricuspid valve; this valve admitted five fingers; internal layers of the walls of left ventricle presented the highest degree of fatty degeneration, with yellow mottling so highly developed as to give a pale colour to the whole surface; this seemed only to affect the inner layers; walls of normal thickness; intestines bound together, and also to the other abdominal organs, by exceedingly fibrous adhesions; in the midst of these a few small very dense nodules, the largest equalling a pea in size, and some distinctly calcareous; kidneys slightly enlarged, cortical substance appearing bulky; spleen enlarged but firm; lungs and liver normal; no affection of bronchial or mesenteric glands. Dr Coats could not find, on microscopic examination, any evidence of the peritoneal affection being tubercular in its nature.

VII.—ON THE SHOULDER-GIRDLE OF BIRDS: ITS MORPHOLOGY AND DEVELOPMENT.

By D. N. KNOX, M.A., M.B., *Demonstrator of Anatomy, University of Glasgow, and Assistant-Surgeon, Western Infirmary, Glasgow.*

(Read before the Natural History Society, Glasgow, March, 1875.)

ON removing the soft parts from the root of the wing of a bird like the common fowl there is discovered a strong bony apparatus lying on the side of the chest, free at its posterior or upper end, but firmly attached to the breast-bone in one or two places at its anterior or lower end. This apparatus bears near its middle a smooth oval-shaped cavity, in which rotates the strong upper wing-bone. It is called by anatomists the *shoulder-girdle*, and to its constituent parts, their nature and development, I wish to-night to direct your attention.

The shoulder-girdle, in its simplest form, in the lowest animals, differs very widely from that very complex structure

which I now show you from the common fowl. It might be considered as merely a continuous strip of cartilage or gristle bent round the side of the chest, attached behind to the spinous processes of the vertebræ and in front to the sternum; or, in default of that, to its fellow of the opposite side. Such, indeed, is the very simple but perfect form of shoulder-girdle of the Thornback skate (*Raia clavata*). But we do not find such simplicity in the adult condition of the higher vertebrates. A process of segmentation occurs, more or less complete, and more or less permanent, by means of which this single strip assumes very various forms, and the original continuity of its various parts becomes very difficult to follow. In this investigation, however, we shall find great assistance by bearing in mind that while the results of development are so different in different classes of animals, the starting point, the order of development of parts, and the conditions of that process seem to be precisely the same in all. In this way the prolonged study in each case of the various modes of the ossificatory process, which we find repeating themselves with great exactness in the same parts of the girdle in different animals, enable us to trace the various segments, and even smallest sub-divisions, with great accuracy, however widely in any individual specimen they may be separated from each other. Into the histological details of these processes I cannot now enter, but shall merely give you the results.

Let me first, however, describe to you the parts of the shoulder-girdle as they are found for instance in this adult fowl. In this shoulder-girdle we find three principal segments, called respectively the scapula, coracoid, and clavicle or furcula (so-called when the clavicles of opposite sides are united into one).

I. THE SCAPULA.—This is a long, tapering, and somewhat curved bone, pointed at its posterior end and slightly bifid at its anterior. It is very narrow and flat, or slightly concave on its under surface, where it lies on the walls of the chest. Its upper or anterior margin is somewhat thickened, and from its inferior extremity a well-marked prominence

is thrown forwards and inwards, to which is attached, by means of strong ligaments, the end of the furcula. This prominence is called the *Acromion*. The position of this process coming off here from the anterior border of the bone, seems to differ from that of other animals. When investigated, this difference is seen to be related to the special form of the scapula in birds. I shew you here the scapula of a dog, in which you see, instead of a flat, sabre-like bone, a somewhat tri-laminar structure, the parts being named the pre-, meso-, and post-scapulae. The meso-scapula is also often called the spine, and the acromion is formed by a hook-like process, which springs from its inferior extremity. The part of such a typical scapula which varies most in size is the pre-scapula, and in birds it is held to be either absent, or perhaps better, that the meso-scapula and pre-scapula have coalesced. Hence we have in birds the appearance of a thickened anterior border and of the origin of the acromion from that border. In all cases it will be noticed that the acromion is directed forwards towards what is called the preaxial border of the limb.

The other process or division of the anterior end of the scapula is the *glenoid*. This is the part of the bone which unites with the coracoid to form the glenoid cavity—with which the end of the wing or arm bone articulates. This union with the coracoid is a constant arrangement. It takes place here by means of ligament, so that the two bones are slightly moveable on each other. In many cases, however, both in birds and other animals, cartilage is the uniting medium till the adult condition is reached, after which the two bones become anchylosed together.

You should further notice with respect to this specimen that the scapula forms an angle with the coracoid, which is acute, or only slightly obtuse. In some birds, as the Ratitæ or Ostriches, the two bones may come to be almost in the same straight line.

In many animals, as for instance the horse, the posterior end of the scapula is lengthened by cartilage, which remains such throughout life, or at least never becomes more than

partially ossified. This, which is called by veterinarians the *cartilage of prolongation*, is yet an integral part of the scapula; it is called the supra-scapula, and corresponds to the pointed tip of this bony scapula of the fowl, which, however, is cartilaginous only in the young state, but forms an epiphysis, which unites with the base of the scapula in the adult. Further, in the shoulder-girdle of birds the scapula forms but one of three large bones, and not even the strongest or largest of these. In mammals, however, the scapula is the main bone, the others being so rudimentary or so blended with it that in the adult they are hardly recognisable. In birds, also, the scapula does not partake to any marked extent in the movements of the limb, while in some mammals it does so to a very considerable extent. This is owing in part to the firm attachment in birds of the scapula to the coracoid bone, and of that again to the sternum, and in part to the position of the acromion process, which in birds is quite away from the shoulder joint, while in such mammals as man it lies immediately over that joint, forming the tip of the shoulder, and a buttress against which in elevation of the limb the head of the arm bone impinges, so that in the last stage of that movement the scapula goes with the limb. In fact in such movements the scapula, by its muscular connections with the trunk and the limb, forms the lever by which they are completed.

II. THE CORACOID BONE.—This is the chief bone of the bird's shoulder-girdle, and is attached by one end to the scapula and clavicle, and by the other to the antero-lateral part of the sternum. It is a somewhat shafted bone, its shaft being constricted and sub-cylindrical, so as to form a very strong pillar of support to the limb. Its lower end is broadened out, and marked by small processes and ridges for muscular attachments. Its upper end is also much enlarged and thickened. This upper end has two processes, the one being *glenoidal*, the other *clavicular*, and between these two is a notch or groove, which with the neighbouring processes of the clavicle and scapula, completes a foramen through which a small muscle plays. On the upper and

outer surfaces of these processes strong but small rounded eminences are seen, which give attachment to the ligaments of the joint.

In its development this coracoid bone resembles most other shafted bones, in being formed of a shaft, the primitive cartilage of which becomes ossified by a process of ectostosis, and of two cartilaginous ends, which look like epiphyses, and which become ossified primarily at least by entostosis. The real nature, however, of these so-called epiphyses is only seen by studying their condition in the lower forms of vertebrates. Let me mention that the shaft (as it appears in birds) of the coracoid is called the *coracoid* proper; the lower or sternal end is the *epicoracoid*, and the upper end is the *precoracoid*. Now, while in birds these separate pieces are only seen in the young and imperfect condition, in reptiles they remain separate from each other throughout life, the epi- and precoracoids retaining also their early cartilaginous condition. Moreover, while in birds the coracoid bone is shafted in appearance, its typical form would not seem to be such. In most animals below the grade of birds the coracoid is really a flat bone, generally of considerable breadth, and may be united to the scapula at one side, by a border of continuous cartilage. We find, too, that the bony part of the coracoid occupies but a small part comparatively of that segment of the girdle. In reptiles the bony part is bounded on three sides by a continuous strip of cartilage, which runs in between the bony scapula and coracoid, and between the latter and the sternum. This cartilage forms at its lower end the epi-coracoid, and at its upper the pre-coracoid. It also impinges upon the clavicle, when that bone is present, and as we shall afterwards see, gives one or two small segmented pieces to complete it. The mode in which the continuous epi- and pre-coracoid cartilages become separated from each other is very interesting, as it is due to the cause which gives the shafted appearance to the bone. In this specimen of the shoulder-girdle of the Iguana you will see four large foramina, two of them belonging to the scapula, and two to the coracoid. These are called *fenestra*.

They vary in number in different animals, but they are very typical and of great morphological importance. Although in the Iguana there are two of these fenestræ to each of the bones, yet one to each is a more common arrangement in other animals, or there may be, as in the skate, a third also, which exists between the scapula and coracoid, so as to belong partly to both. These fenestræ are seldom entirely surrounded by bone, that tissue being usually found on one side only, and cartilage on the other. They are also of various sizes and shapes, and from a comparative view of their constant relations as well as differences, anatomists are now agreed that they represent steps more or less advanced in that process of segmentation by which the various parts of the shoulder-girdle are differentiated from the common mass. In this light the narrow and shafted coracoid of the bird is the broad and flat coracoid of the reptile, in which the breadth has been reduced by the interposition of large fenestræ, so large indeed that the soft cartilaginous wall has become deficient in its middle unsupported part, and all that remains of the continuous mass are the shafted bone and cartilaginous epiphyses of the two ends, with perhaps the small additions to the clavicles previously mentioned, and which are derived from the precoracoid portion of the cartilage.

III. THE CLAVICLE OR FURCULA.—This is the most complicated bone in the girdle. Consider it first as it occurs in the adult fowl. It here forms a median bone of fork-like appearance, united at its lower part to the front of the sternum or breast bone, and at its lateral extremities to the coracoid and scapula of each side. The arched parts of this furcula are slender and round, while their ends are somewhat thickened. Where they meet in the middle line below, there is a flattened process called the *hypocleidium*; their other ends are somewhat bifid, forming a terminal process which articulates with the acromion process (meso-scapula) of the scapula, and a lateral process of varying size which articulates with the upper end of the coracoid bone. These various processes, while ossified by extension of ossification from the shaft of the clavicle, are yet not pro-

perly said to belong to that bone, but are rather displaced portions of the other bones of the girdle.

The curved portion, or clavicle proper, is remarkable for being one of the first bones of the skeleton to ossify, and also for the mode in which that process goes on. In the other bones of the girdle ossification proceeds in cartilage, either by the deposit of bone appearing first in the interior of the mass and gradually passing outwards (entostosis), or by the deposit appearing first on the exterior of the mass and passing inwards (ectostosis). But, in the clavicle ossification proceeds in membrane without the presence of cartilage, this process being called parostosis. The greater part, however, of each end of the clavicle is formed by entostosis, the only exception being in the hypocleidium, where a small part called the interclavicle is ossified by parostosis like the clavicle. In this drawing (Fig. 3) of the lower part of the clavicle in the Herring Gull the mode of formation of the hypocleidium is seen. The two clavicles are represented as being separated merely by a narrow interval or suture which afterwards fills up, and upon the under surface of the suture there is a small pointed piece of bone quite separate as yet from both clavicles. This is the interclavicle (Parker), a bone which appears much more largely developed in some reptiles, (Fig. 4), and which is even present, according to some anatomists, in the girdle of man. In birds and reptiles it is azygous and median, but in man, if it be present, it would seem to be symmetrical on the two sides. Behind the interclavicle there is also a considerable mass of cartilage, the morphology of which is best understood by reference to the girdle of reptiles. In this prepared specimen of the girdle of the Iguana, the rim of cartilage which, as already pointed out, runs round the greater part of the coracoid bone, impinges on the interclavicle and clavicle, and at two places, namely, at its anterior inferior angle, and opposite the junction of scapula with coracoid; it is held that portions of this cartilage remain permanently in the girdle of birds while all the rest has disappeared. These two small portions become ossified by

extension of bone from the clavicle, and so play the part of epiphyses of that bone. That part of the cartilage which is found in the hypocleidium is called the distal precoracoid, *d, per*, while the other part, which forms the process whereby the clavicle articulates with the coracoid, is called the proximal precoracoid, *p, per*. The extreme upper end of each clavicle is also covered by cartilage when in a young state. This cartilage is sometimes continuous with the lateral precoracoid cartilage, even as you see again, occurs in the Iguana, but from its connection with the acromion or meso-scapula is held to belong to that bone. This displaced segment is ossified similarly to the pre-coracoid by extension of bone from the clavicle. It is called the meso-scapular segment, *m sc, s*.

Such then are the typical elements of the shoulder girdle, but we find great varieties as regards their relative size and development even in the bird class. In some cases one or more parts are absent entirely. Thus, in some of the parrot tribe the clavicles are wanting, or are only represented by the meso-scapular segment, which remains as a small square bone placed on the inside of the upper end of the coracoid. In others of the same group the clavicles are present, but are not united into a furcula, the parts of the hypocleidium only being absent. But the greatest divergence from the ordinary bird type occurs in the ostrich family, where the parts of the girdle become fused together into one sabre-like bone. The clavicle is entirely wanting except in the casowary, where it is represented by a small oval-shaped nodule placed on the tip of the hooklike pre-coracoid (Fig. 6). The coracoid and scapula are ossified separately and meet at the glenoid cavity. The epi-coracoid forms an epiphysis of some size at the lower end of the coracoid. The pre-coracoid forms in *Struthio* and *Apteryx* a large bony flange or bar, placed in front of the coracoid and separated from it by an oval foramen; in *Casuaris* it is a bony hooklike process, projecting downwards and forwards from the front of the upper end of the coracoid; in *Rhea* it is a small process of cartilage merely. The supra-scapula is a large cartilaginous

epiphysis, and the meso-scapula is represented by a small nodule situated above the foramen and which is ossified from the scapula. The entire girdle of this group is more closely allied on the one hand to that of the crocodiles, and on the other to that of mammals than in the case of other birds. In fact it may be looked upon as a kind of bridge between reptilia and the more highly-organized mammalia.

Of mammalia, again, the girdle of man is perhaps one of the most complete as regards the number and relative development of its parts. In the adult the various osseous centres have blended so as to form two distinct bones, called clavicle and scapula, while the coracoid, so large in birds, is reduced to the position of a mere hooklike process of the scapula. In the young state the various parts are seen with remarkable clearness. The young clavicle is tipped with cartilage at both ends; that at the inner or sternal end corresponds to the distal pre-coracoid and ossifies separately, forming a distinct epiphysis; that at the outer end is the meso-scapular segment, and ossifies by extension of that process from the rest of the clavicle. At the sternal end also there exists an interarticular plate of fibro-cartilage, called by Parker omo-sternum, and regarded by him as belonging properly to the sternum, but which is, according to Gegenbaur, the representative of the inter-clavicle. Those anatomists who follow Parker's view hold that the inter-clavicle is best seen in two little nodules sometimes found in man at each side of the upper end of the sternum, and called epi-sternal bones. In many other mammals the clavicle is entirely absent. In the horse it is merely represented by a floating short rod of condensed fibrous tissue found in the occipito-humeral muscle.

In the young scapula of man the various parts are well developed. The meso-scapula is especially large, and its acromion process is tipped by a large cartilaginous epiphysis. Along the base of the scapula there is also a long cartilaginous epiphysis or supra-scapula, which is wholly ossified by endostosis before it unites with the body of the bone, differing thus from the cartilage of prolongation of the horse, etc.,

where only that part of the cartilage nearest to the scapula is ossified in its interior, its surfaces and more distal parts remaining throughout life cartilaginous.

The coracoid of man springs as an epiphysis from the upper border of the pre-scapula. It is a small curved process entering by its base to a very slight extent merely into the formation of the glenoid cavity. Such an appearance is here shown in the young scapula of man and of the dog. At the root of the coracoid, and separating it from the rest of the pre-scapula, is a small coraco-scapular notch, reminding us of the notches seen in reptiles and even so low in the scale as the skate.

DESCRIPTION OF PLATE.

Fig. 1. The shoulder girdle of an adult *Larus tridactylus*. *Cr.*, coracoid; *sc.*, scapula; *gl.*, glenoid cavity; *cl.*, clavicle; *hc.*, hypocleidium. Natural size.

Fig. 2. From *Phasianus colchicus*, after 9 days' incubation. *Cr.*, coracoid; *ecr.*, epicoracoid; *p per.*, proximal pre-coracoid; *cl.*, clavicle; *icl.*, inter-clavicle; *d per.*, distal pre-coracoid; *sc.*, scapula; *msc.*, meso-scapula; *mssc.*, meso-scapular segment; *ssc.*, supra-scapula. $\times 6$ diam. (Parker.)

Fig. 3. The furcula of embryo *Larus Argent*; showing the mode of formation of the hypocleidium and other processes. $\times 10$ diam. (Parker.)

Fig. 4. Left shoulder-plate and sternum of *Iguana tuberculata*. The oval shaped spaces represent the fenestræ; the other parts are indicated by the same letters as in fig 2. Natural size. (Parker, and from nature.)

Fig. 5. From embryo *Struthio camelus*. $\times 2$ diam. (Parker.)

Fig. 6. From *Casuarus Benettii*, ripe chick, showing the rudimentary clavicle and hook-like pre-coracoid. $\times 1\frac{1}{2}$ diam. (Parker.)

Fig. 7. From adult *Apteryx Austr.*; with small part of sternum. $\times \frac{2}{3}$ (Parker.)

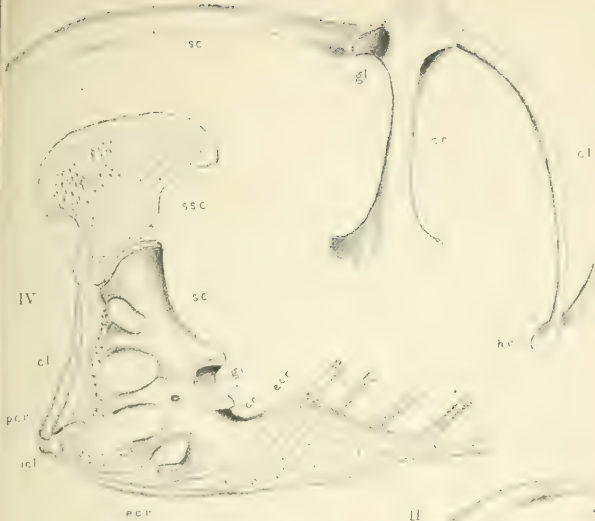
VIII.—ON THE UNILATERAL PHENOMENA OF MENTAL AND NERVOUS DISORDERS.*

By ALEXANDER ROBERTSON, M.D., F.F.P.S.G., *Physician to the Town's Hospital and City Parochial Asylum, Glasgow.*

BOTH in physiology and pathology the study of the simple, the incomplete and the imperfect forms usually sheds a light, sometimes very clear, on the more complex and fully developed types. In physiology, for example, such works as those of Spencer, Maudsley, Laycock and Carpenter show how much the nature of mind in relation to organization is elucidated by careful observation of the nervous

* Read in the Psychological Section at the annual meeting of the British Medical Association, held in Edinburgh, August 1875.

I



II



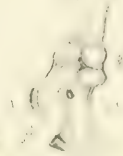
V



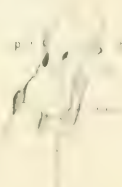
III



VI



VII



system in the lower orders of the animal kingdom, and of its condition in the abortive and morbid specimens of the human species. In pathology, likewise, it is not where disease has advanced to its last stages that we may expect to find out its real nature; we must look for it rather when the pathological change is only beginning, in the tissue that deviates but little from the healthy standard. So in the special pathology of the nervous system much may be learned respecting the more serious diseases by minutely examining and considering the features of the slighter and less striking disorders.

In this connection the group of phenomena that form the chief subject of the following paper are of considerable interest. So also is the relation in which they stand to each other; how far they may be considered as simply analagous conditions without causative connection, and to what extent in certain cases they may be correlated. Besides, as merely important events in the disorders of which they are symptoms, they merit close observation.

The field of study thus indicated is, however, much too extensive for the limits of this communication. My remarks will therefore be restricted to a portion of it. I propose first to illustrate some of the principal varieties of psychical and somatic disorders in which unilateral phenomena occur, drawing the illustrations mainly from my own practice. The mental group, as is fitting here, will receive our chief attention; next in order the motor class will be considered, and thereafter, though very briefly, those belonging to the sensory and trophic spheres.

I. *Unilateral Mental Phenomena.*—These consist of illusions and hallucinations, and possibly also of the peculiarities supposed to be due to the separate and independent action of the hemispheres. The two first have received but little notice in works on psychology published in this country. More consideration has been given to them in French treatises. Thus Brierre de Boismont, in his book on hallucinations, refers to Calmeil's observations on the phenomena in question, and more particularly to those of M.

Michéa who gave them the name "*d'hallucination dédoublée*." He quotes from the latter a striking case in illustration, and also refers to such hallucinations as occurring in the senses of touch, sight and hearing. Gall relates the case of a Minister of State in Vienna who was constantly hearing insulting expressions on the left side, so that he was very often turning his eyes in that direction to see where they came from, although, Gall adds, perfectly convinced in the right side of his head that they were delusions of the left side. Griesinger states that a patient was under his care in whom the hallucinations of hearing continued during the whole duration of the insanity, and were confined to the left side. Van der Kolk narrates the case of a female patient who was continually plagued by the devil talking in her left ear; and remarks, "This is, moreover, the only case with which I am acquainted where the hallucinations were confined to one ear." It might be supposed from these statements that one-sided sensorial disturbances were of rare occurrence. My observations, however, lead me to think that they are by no means uncommon, and that their rarity is more apparent than real—is due probably to the point having been seldom investigated, at least in the stage of insanity where they are most frequently present. With the view of ascertaining the proportion they bear to bilateral hallucinations, and, generally, being interested in the relation of sensorial disturbances to each other and to the other phenomena of cerebro-mental disorders, I made a careful examination of 250 insane patients, these being, with a few accidental exceptions, all the cases in the asylum under my charge during last year. The results of my inquiries are as follow:—34 patients were found to entertain clear and well-defined illusions or hallucinations of one or other of the senses. These 34 were by no means all who were so afflicted. There were many more in whom the special phenomena were so combined with delusions proper, or whose intellect was so enfeebled, or who were so obstinate or reticent, that reliable information could not be obtained from them. My observations, therefore, have reference to these 34 patients.

With respect to causation, in fifteen cases the mental disorder was clearly due to alcohol; in five to domestic trials; in two there was a strong hereditary tendency without obvious exciting cause; and in ten the cause could not be ascertained. No fewer than 31 heard imaginary voices, besides, in some cases, other unreal sounds; only three being free from auditory troubles. Twenty-nine were either seeing imaginary forms about the time of my examination, or adhered to the belief that they had seen them at some previous time since their illness began. Two suffered from illusions or hallucinations of taste, and one from similar disorders of smell; both sight and hearing were unaffected in each of these cases. In one the hallucinations were confined to taste; smell, sight, and hearing being normal. Fourteen complained of various alterations of general sensibility, such as stinging pains in arms or legs, feeling of numbness (localized in some, but varying in its site in others), and other sensations, many of which were probably real.

Of the 31 cases in which hearing was involved, in five the voices were heard only in the left ear, and in five others in the left more than in the right; in one they were audible in the right ear alone, and in two they were stated to be more distinct in that ear than in the other one.

The disorders of all the other senses were bilateral; at all events they could not be determined to be unilateral, except to some extent in one patient who saw the hallucinatory objects much more distinctly with the right eye than the left one. The objects seen in this case were of different colours—black, blue and red being particularly mentioned. There was no apparent difference in the visual power of the two eyes.

I shall now submit some details of the cases of unilateral auditory hallucinations.

Case 1.—M. L., age 58; admitted 30th June, 1874. This woman confessed to have been of drunken habits for many years. Occasionally, after an excess, hallucinations of vision would arise accompanied by a feeling of fear. The phenomena have always been the same on each occasion.

Her principal trouble has been the figure of a black man following her and using threatening language, such as, "If I could get at you, I would throw you over the window." The voice is heard in the right ear, never in the left one. Some years since there was a discharge of purulent matter from the right ear; but the power of hearing real sounds in that ear is equal to that of the other one, which is normal. This patient soon recovered and was dismissed cured, but did not leave the ordinary wards of the establishment. Here she had no opportunity of getting alcoholic stimulants, but notwithstanding her abstinence from them her mental disorder returned in the same form as before with exactly the same hallucinations, those of hearing being confined to the right ear. The relapse* would seem to have been caused by the mental worry to which she had subjected herself through her anxiety to return home, while unable to see how she was to be supported there.

It will be observed that the voice was a male one, and it was always so in her case. This is not exceptional in women, as I find that it is not uncommon for them to hear only male voices. Thus, 18 of my 34 patients were females, and five of them were troubled with the voices of men alone; the others heard both male and female voices, sometimes the one and sometimes the other. I did not find that any of the men heard female voices exclusively, though I do not doubt that a similar limitation occasionally occurs in them also.

Case 2.—T. S., age 28, daughter of the last patient; admitted 28th November, 1874. This woman is very intelligent, and had fully recovered when she gave me the following history of her mental disorder:—For two months before her illness was fully established she was much depressed about her mother's dissipated habits. About three weeks previous to admission, a voice began to trouble her on the left side of the head. It seemed that of a man who spoke to her in a loud and threatening tone. She is quite sure that, whether lying

* I have observed a similar occurrence in other cases of insanity arising from the same cause, where, if there had not been a certainty that the patients had not got alcohol in any form, it would have been supposed that the relapse was due to fresh excesses.

in bed or walking about, the voice was on the left side alone. It was most troublesome in the evening and during the night. She believed it to be real at those times ; so much so that she was on the point of jumping out of the window through alarm at the threatening language ; but generally when heard during the day she considered it must be a delusion. The tick of a watch was heard in left ear at the distance of six inches, and at ten inches in the right one. *Sight*.—She imagined once, the day before her removal to the asylum, when in bed and quite awake, that she saw her mother standing naked beside her. For a day or two she had also been troubled with the appearance of a dark cloud before her eyes, through which red lights sparkled. Frontal headache was then often very troublesome. Eyesight and pupils normal. Smell has always been correct. A bitter taste was felt in almost every article of food, and there was also want of appetite. Common sensibility appears to have been normal.

Case 3.—M. T., age 65, housewife ; admitted 28th October, 1874. The following statement regarding her illness was made by her after recovery :—This is her second attack of insanity. She freely admits that some years ago she occasionally indulged to excess in alcohol, but has been very temperate lately. Her illness is ascribed to want and hardships. No hereditary taint is acknowledged, but she has a son insane. “Voices” troubled her greatly. She thought that two men (never women) were speaking about her in a low tone, but does not remember what they said. She is quite sure that whispers were only in the left ear—“perfectly sure.” Hearing distance is seven inches in right and nine in left ear. *Sight*.—The hallucinations or illusions of this sense were very vivid. In daylight she fancied she saw her family around her dressed as usual. The objects were seen with both eyes. She thinks that possibly she may have mistaken the people around her for her relatives. Smell, taste and common sensibility appear to have been correct.

Case 4.—W. B., age 35, smith : admitted 14th January, 1875. The following note of his case was taken three days after admission when his mind was clear :—For many years he has been of drunken habits, and has several times suffered from

delirium tremens or mental disorder allied to it. The present attack was of three days' standing before admission. The mental powers were chiefly involved, there being very little motor or sensory disturbance. He heard voices both of men and women, but only in the left ear. They were always threatening, such as, "I'll do for you to-night." Though of themselves heard only on the left side, he said he could make them come to the right ear too by lying thinking about them. He remembers that in all his previous attacks the voices always appeared to be in the left ear. *Sight*.—On the morning of his admission he thought he saw "Jesus Christ in a big chariot coming down the street," who told him he was to be flogged at 1 p.m. Thereupon thinking that as he was to be flogged it would be better to leave his clothes behind him, he stripped himself stark naked, and actually ran down one of the public streets of the city in that condition at midday. He also fancied he saw many small animals of different colours. Eyesight was good; and hearing distance was equal and normal for both ears. Smell and taste were correct. He has an itching feeling in skin. Frontal headache is complained of.

Case 5.—J. P., age 34, waiter; admitted 17th January, 1875. He stated when his mind was clear that for the last eighteen months he has drunk, on an average, a quart bottle of common whisky daily, and believes that some days he may have drunk two bottles. Notwithstanding these habitual excesses he never suffered from mental aberration till about a week since. He then began to hear sounds like music in the left ear; and soon a voice accompanied it, which seemed occasionally a man's and at other times that of a woman. It, too, was always in the left ear; he was sure that it was not in both. Hearing distance, as tested by the watch, is equal in both ears, but does not extend above six inches from the head. *Sight*.—Eyes ferretty; pupils natural; no unreal colours seen, and he can distinguish different shades easily. On one occasion he fancied he saw two soldiers fighting with crossed bayonets, and several times thought he perceived God coming down from heaven in a chariot. *Smell* is less acute in left nostril than right one; no subjective odours have been experienced. *Taste*

is normal. *General sensibility*.—He states that he has often a darting, catching feeling in left thigh.

Case 6.—J. F., age 30, labourer; admitted 13th November, 1874. This man has been of drunken habits for twelve years; he did not indulge daily in liquor, but every two or three months he had a spell of drinking for eight or ten days, and in the intervals he was all but a total abstainer. He has had four convulsive seizures at considerable intervals from each other. These attacks have always been preceded by a crampy sensation beginning in right hand, passing upwards to the shoulder and head, after which he became unconscious. On the day before his admission he heard a voice on the left side of the head. No visual phenomena. After a drinking bout he has generally had a feeling of sleepiness in both upper and lower extremities for two or three days.

Besides these cases there were, as has been stated, several others in which the hallucinations were more pronounced in the one ear than the other. In one of them the imaginary voices were heard occasionally in the left and at other times in the right ear, generally the former; but never in both at the same time. In another patient, a man aged 52, the voices are most distinct in the right ear. The insanity is of several years' standing, and was due to alcohol. About thirteen years ago his right leg was amputated immediately below the knee on account of an injury received in a railway accident. Ever since his admission into the asylum he has frequently complained of darting or burning feelings in the stump which seems quite healthy. These are described occasionally as like a flame of fire, and are said to extend upwards to the body. He further states that the "blessed Virgin," angels, and men go in at the stump; but sometimes the visitors are devils. They usually tell their names when they enter. They go up to the throat, and generally make their exit there, but now and again they return and leave his body through the stump. This occurs both day and night, but most frequently during the day. There is no peculiar sensation or delusional idea associated with general sensibility in any other part of his body.

With respect to these cases it is to be observed that, in three

out of the six characterized by unilateral hallucinations, the mental disorder was the immediate effect of alcohol; and in two of the other three the patients had been previously of drunken habits. All the acute cases were of brief duration and were dismissed cured. Two of the others also recovered, though one of them has since relapsed. It would seem, then, that one-sided psycho-sensorial phenomena are most apt to occur in the milder and more ephemeral forms of insanity, and particularly when it has been caused by the stronger alcoholic liquors.

The frequency with which the hallucinations were referred to the left ear is very striking. Thus, only once among the six one-sided cases was the right ear alone involved; and when it happened that though the "voices" were heard in both ears they were louder in one than the other, this occurred much more frequently in the left than the right one. And it is worthy of note that in the cases quoted from Gall, Griesinger and Van der Kolk the hallucinations were also on the left side. Griesinger, however, refers to some cases recorded by Kieser, in which the auditory phenomena were on the right side.

Among my patients, except to a slight extent in case 1, there was neither defect nor peculiarity in hearing in the left more than in the right ear; but some of them were a little deaf in both ears.

We shall now consider the pathology of these phenomena. In a number of cases of bilateral hallucinations on record the nerves of the special sense or senses involved were found atrophied or otherwise diseased after death. Thus, in some instances of illusions or hallucinations of vision the optic nerve and tract are stated to have been in a morbid condition. The most important case of this kind that has been recently published is one by Dr Clouston, in which disease of the nervous system, beginning by blindness, afterwards developed into general paralysis with insanity. On examination by the microscope, that gentleman was able to trace degeneration along the optic nerves and tracts as far as the *corpora quadrigemina*. Dr Batty Tuke has published cases of hallucinations of smell and hearing, in which the olfactory

bulbs were much degenerated in one patient and disease existed in the neighbourhood of the *portio mollis* in another. What has been observed where the phenomena are bilateral doubtless occurs occasionally where they are only unilateral, though I am not aware that any cases of this kind have been recorded. I myself had a patient under me with blindness of one eye, in whom after death the optic nerve was seen to be greatly atrophied; but he was not insane.

In some of these cases disease would appear to have begun at the sense-organ, and thence to have gradually extended to the highest cerebral ganglia. At all events, the probability of such extension seems considerable, in view of the facts ascertained regarding general paralysis. Both clinical observation of the course of this disease and microscopical examination of the morbid parts show that it occasionally commences in the cord and gradually creeps upwards to the brain. Cases have occurred in my own experience where the progress of the symptoms led me to that conclusion regarding its origin. Dr A. Foville has also detailed the histories of several patients in whom, as in Dr Clouston's case, the morbid action apparently began in the cranial nerves.

But though impressions received by the organs of the senses whose nerves are in a morbid condition may in some instances, when conveyed to the sensorium, be transmuted into forms most unlike the objects they represent and, further, be accepted by the mind of the individual as real, should he be insane, it is probably not often that either illusions or hallucinations arise in this way. They are in all likelihood much more frequently due to disease in the sensorium itself or in the "perceptive centres" which, there is reason to think, exist in the hemispherical ganglia. An excitation of the visual sensorial centre for instance, by a pathological process within itself, would in accordance with well-known laws of nervous action produce images of objects external to the individual, though no such objects were really there. Or, if a perfectly healthy impression coming from without were made on that centre while in that condition, the images presented to the mind would probably be altered as much as, or probably more than if the transformation had occurred in the organ of sense itself or at any point before the impression reached the morbid centre.

Further, it is not unlikely that disease originating in the highest centres of the brain, particularly when it has reached an advanced stage, may sometimes pass downwards and even proceed as far as the external organ itself. This is in accordance with what is found occasionally in hemiplegia of long standing, with marked atrophy of the hemisphere. In these cases the motor tracts through the pons, medulla oblongata, and spinal cord degenerate and become atrophied. I have met with striking illustrations of this condition, where at all events the atrophy extended to the cord, and would probably have been found to implicate that organ also had it been subjected to examination. As a possible illustration of this backward extension of disease, I may mention that in the most marked case of auditory hallucinations at present under my care, the patient, a female, is nearly altogether deaf in both ears; and about two years since a patient of mine who was completely blind in both eyes was subject to occasional attacks, in which the hallucinations were remarkably clear and well defined. The insanity preceded the blindness.

Neither physiology nor pathology supplies us with facts which warrant definite opinions respecting the anatomical seat of hallucinations, whether referred to one or both sides. I shall not therefore dwell on this point beyond making a few observations on the indications derived from the present state of our knowledge of the brain and its functions, both in a healthy and in a diseased condition. I think it may be considered as improbable that these phenomena are associated with the nuclei to which the nerves of special sense proceed; for example, with the corpora quadrigemina in the case of the optic nerves, or the medulla oblongata in that of the nerves of hearing. Though the fibres of these nerves probably terminate there, it is well ascertained that others connected with the same cells are "projected upwards" (to use Meynert's term), possibly passing through other centres, till they reach the surface of the brain. The auditory and other sense-impressions are thus represented in the highest ganglia. The locality of the senses of hearing and smell has even been indicated by the experiments of Dr Ferrier. The auditory centre he considers to be in the superior temporo-sphenoidal convolution, and the olfactory one to be in the uncinate convolution. These points, however, are far from

being established; consequently all speculations respecting the pathology of such centres must necessarily be vague and unsatisfactory. It is to be hoped that the further experiments of that gentleman and of other distinguished investigators on the Continent may ere long throw light on these difficult questions.

But, passing from this inquiry, we proceed to another question which naturally arises in connection with the subject under consideration. How does it happen that the centre for one side is sometimes implicated while the other is free? It seems to me that much light is thrown on this, as well as on other points in cerebro-mental disorders, by a study of Sir James Paget's philosophical views on general pathology. He very clearly shows, what might indeed *a priori* have been anticipated, that when a part is congenitally weaker than it should be, or has been weakened by disease, though it may be restored to an apparently healthy state, it is apt to be affected first and to suffer most when a general morbid action arises in the system. An interesting case, illustrating this disposition, occurred in my practice several years since. A child in one of the wards of the hospital, suffering from a trifling erythema of the upper lip became feverish, and at the same time the red surface extended over the side of the face and deepened in colour, assuming an angry aspect. The next day and the day following the affected side of the face was swollen and had become purplish in hue, and the general symptoms were aggravated; but on the fourth day a copious eruption of measles fully explained the cause of the constitutional disturbance. We had here, then, a surface slightly enfeebled by disease participating in a new and general morbid action, both earlier and more severely than the neighbouring sound integument. Now, to apply this principle, we may consider that in unilateral hallucinations the special centre involved is weaker on the one side than the other, through some cause either congenital or acquired, and that such an agent as alcohol in the blood acts with special virulence on the affected part. Assuming that it is abnormally weak, may not this be the point from which the morbid action spreads over the mind centres? just as in Ferrier's experiments the repeated irrita-

tion of a small portion of the cortical substance sometimes resulted in general convulsions.

Before leaving this department of the subject, what has been called the dual action of the hemispheres merits a few observations. It is held that in this condition there is defective co-ordination of the lateral halves of the brain, in consequence of which the individual speaks and acts as if he were two personalities in one body. A female patient at present under my care is a good illustration of this apparently dual state. During the day she is usually calm and nearly rational, but after about nine or ten at night she becomes excited and talks aloud, maintaining a conversation with herself just as if some one were beside her though there is no one there. I have several times stood outside her bed-room and listened to these conversations. Questions are put and answers given in two different tones of voice, the one being deep and masculine, the other feminine but much shriller than her own natural voice. Both voices always maintain their respective individualities in this nightly drama. However, though such cases as this may possibly be the result of the separate action of the hemispheres, the unilateral feature is much less clear than in the case of one-sided illusions and hallucinations.

II. *Unilateral Motor Phenomena.*—The chief forms are the convulsive, the choreic, and the paralytic. I shall restrict my observations almost entirely to the convulsive class. I remark, then (1), that one-sided convulsions do not always begin in the same part in the same case, even though there be no reason to think that there is any appreciable change in the morbid centre. In illustration I refer to a paper of mine published some years since,* in which it is shown that in one case the convulsions began in different parts of the body, even though there might be only a few minutes of interval between the seizures. This then shows the necessity of not too hastily drawing the conclusion that, because convulsive movement is observed to commence in a special muscle or set of muscles, therefore the source of their motor power is in a part of the brain where there is a lesion. For it is by no means improbable that a lesion may

* On Unilateral Convulsions, Localization, &c. *Edinburgh Medical Journal* for 1869, page 513.

occasionally prove more irritating to a neighbouring part, or even to one considerably removed, than where it actually exists. This principle is well illustrated by morbid sensations. Thus a decayed tooth, though it may be but little painful itself, occasionally gives rise to a severe supra-orbital neuralgia; a diseased hip-joint may disclose itself chiefly by pain in the knee; and other similar phenomena might be adduced. At the same time it is to be observed that the order in which the muscular system is involved is usually the same in successive attacks. Dr Hughlings Jackson has lately pointed out that, when they begin in the upper extremity, the thumb is first affected. An illustration of this was recently under my notice. However, it is a rule subject to not infrequent exceptions.

(2.) In unilateral convulsions the so-called bilateral muscles are implicated, but the twin muscles of the otherwise sound side in most cases do not contract so firmly as those on the side first convulsed. This fact I have often observed in relation to the abdominal muscles and the *orbiculares palpebrarum*,* and other facial muscles, as well as those of the limbs. By attending to this, it is very often possible to tell on what side the convulsions began in cases where they were originally one-sided. This is important in reference to the diagnosis of the side of the brain in which the lesion exists. Thus, when a physician is called in to a case of general convulsions which were unilateral at the commencement and can obtain no account of the course of the convulsive movements, or, what is much the same, cannot rely on the information he obtains, by simply grasping the limbs of the two sides, or even by laying his open hand somewhat firmly on the abdominal wall, he may ascertain for himself in most cases which hemisphere is the seat of lesion; for the side on which the muscles are firmer than their fellows is the one opposite to that in which the brain is involved. For instance, should the contracted muscles of the left leg and arm be harder than those of the right ones, the disease is in the right hemisphere. If, however, the convulsions are very severe, there may be scarcely any appreciable difference between the two sides. I have noticed this in some cases.

* See paper already quoted.

(3.) There may be *alternate* conjugate deviation of the eyes during the same convulsive seizure. I have recorded a case of this kind in the paper from which I have already quoted. Thus, in one paroxysm the left side was first convulsed, and then the head and eyes deviated to the left. In less than a minute the convulsive action extended to the right side, the head and eyes revolving on their axis and deviating even more decidedly to the right than they had previously done to the left. In this exceptional case both hemispheres were diseased at the surface, though in very different degrees.

(4.) A study of cases reported by other observers as well as of those in my own practice leads me to the conclusion that, as a general rule, convulsions beginning on one side and from a unilateral lesion are more disposed to become bilateral the higher up in the brain the lesion is situated; *e.g.* that where it is down in the pons or medulla oblongata the convulsive movements are less apt to involve the opposite members than where it is in the cortex of the hemisphere. A little consideration will show that this is what might be anticipated from the increasing complexity of the relation of parts with each other, both in the same hemisphere and with the opposite one, as they ascend from the spinal cord to the surface of the brain.

(5.) Where convulsions begin on one side there is frequently a distinct and sometimes a prolonged interval before consciousness is involved; and it is occasionally retained throughout the whole seizure, should the seizure be a mild one. This happened in the case of a little boy who died in this hospital about four years ago, and was subject to fits of general convulsions beginning in the right hand. At the commencement of one attack he cried out to the patient in the next bed, "Oh! wife, see how my hand is going." While I stood beside the patient Scott* on one occasion, observing the contractions of the muscles of the side of the face and neck, he directed my attention to the fact that his right leg had become affected. Soon afterwards the convulsions became general and consciousness was in abeyance. On another occasion, when the whole right side was affected, I asked him if he knew me, to which he replied "Yes, I do."

* See the paper quoted.

(6) There is a decided increase of temperature in the convulsed members, at least in cases where the movements are vigorous. Thus, I have noticed a difference of as much as 2° between the convulsed thigh and the unaffected one. This contrasts with the condition in hemiplegics, which varies according to the site of the lesion. Some years since I examined the axillary temperature on the sound and the palsied sides in 39 hemiplegics, with the following results:—In 22 cases the palsied arm was colder than the healthy one, the amount varying from $\frac{1}{2}^{\circ}$ to $\frac{3}{2}^{\circ}$; eight were warmer, varying from $\frac{2}{3}^{\circ}$ to $1\frac{1}{3}^{\circ}$; nine were alike on both sides. In almost all these cases the hemiplegia was of considerable standing.

III. The unilateral phenomena of other functional nerve disorders are so numerous and diversified that the limits of this paper do not permit me even to enter on them. I remark generally, however, that there seems much less disposition when the lesion or source of irritation is on one side, whether central or peripheral, for the disorder of *sensation* to become bilateral than where the affection is in the motor system. No doubt instances of such extension are by no means uncommon. Thus, the pain of a diseased tooth is occasionally felt even more severely in the corresponding one of the opposite side than in the unsound one; or the smart pinch of an anæsthetic limb may appear to the mind as a painful sensation in the corresponding part of the sound limb; or the converse of the latter may happen, as is well illustrated by a case of Dr Bastian's, in which the application of a cold spoon to an anæsthetic arm produced a pricking sensation, followed by convulsive movements of the whole limb, which (both pricking sensation and reflex muscular contractions) were revived by the application of the same spoon to the corresponding part of the sound limb. But though this "irradiation of sensations" is occasionally met with it, as I have already indicated, is relatively less frequent than the extension of unilateral into general convulsions.

In connection with this contrast between pathological motion and sensation, I shall briefly illustrate by a case under my care at present another point of difference between these two classes of phenomena, at all events when they are due to severe central

lesion, namely, the greater regularity of the motor than the sensory symptoms. In ordinary hemiplegia or paraplegia there is a tolerable uniformity in the mode in which the muscles are affected, though in hemiplegic disease there is considerable variety in the extent to which the upper and lower extremities are involved in different cases. But we do not find some muscles in a limb normal in respect to power, or almost so, while others near them are completely palsied. Irregularities are, however, very common in cases of hemi-anæsthesia or general anæsthesia. Thus, in my patient there is no distinct impairment of motor power anywhere, although there is almost complete loss of tactile sensibility in most parts of the trunk and extremities, and particularly in the hands. On the right side of the abdomen, however, sensibility is not greatly affected, while on its left side and on the right side of the chest anteriorly it is much more defective. Again, there is a zone of integument on the left side of the lumbar spines where he feels slight pressure with the points of the compasses pretty readily, but in most parts of the back this form of sensibility is deeply affected. The anomalies of other forms of sensibility, particularly the power of appreciating heat and cold, are even more marked. For example, cold from water is felt to be cold and is very painful on the front of the chest; but very hot water applied to the same parts is either not felt at all or, if it yield a sensation of being touched, he "cannot say it is hot." He can, however, distinguish between the two applications in the comparatively sensitive zone in the lumbar region. The patient suffers from a subjective general feeling of intense cold which he says is exceedingly painful. The disease in this case, I think, probably commenced in the central grey matter of the cord, and thence it has extended upwards to the brain, implicating the cerebral centre for common sensibility which late observations would seem to show is in or near the upper part of the pons varolii rather than in the thalamus opticus, as formerly supposed.

Many of the recorded cases of hemi-anæsthesia present features similar to those I have just described, showing how much more diverse are the symptoms of sensory than of motor disorders.

In now taking a general survey of these different classes of phenomena, it is interesting to observe that one-sided disorders of motion and sensation have their analogies in the sphere of mind. An imaginary voice heard in the one ear, or a visionary form seen on one side, has its counterpart in the one-sided convulsion or neuralgia; and just as the partial may merge into the general convulsive seizure, or as the limited disorder of sensory function, such as is seen in a severe neuralgia, may, though more rarely, be diffused in various directions along sensory nerves, so may the sensorial disturbance evinced by an illusion or the psycho-sensorial disorder manifested by hallucination become generalized, involving the mental powers in varying degrees in different cases. A good illustration of this gradual merging of illusion into insanity was presented about nine months ago by a female patient in the hospital under my charge. I shall relate the case somewhat in detail, as it presents several features worthy of notice:—Her age was 66 years; and she was admitted on account of an attack of rather severe jaundice, from which she recovered for the most part, but her skin was never fully restored to its natural hue. Sensorial disturbances were first complained of on the 24th September. On that date she told me that two nights previously she imagined (her own word) she saw her dead husband come into the ward and walk straight to her bedside. He seemed to have his coffin in his hand, to which he pointed; but he said not a word, and after a minute or two went away. In like manner her deceased mother and children came in as if they were in life, looked at her and left the apartment. At the time of their occurrence she considered these appearances to be real, but was thoroughly convinced next morning that they were imaginary, and thought so when telling me about them. She felt sure that it was not a dream.

20th October.—This morning she told me that a skeleton appeared to her two days before towards night. First it stood at the foot and then at the head of her bed, after which it disappeared. Her head was sore at the time, and she knew, she said, what she saw was just owing to the state of her brain.

11th November.—To-day she stated that this morning before the gas was fully screwed up, and while the ward was still dimly

lighted, she saw what seemed to be a grave in the middle of the floor. It was open, and standing by were a man and woman dressed in their night-clothes. They appeared to be gathering bits of broken coffins, which they carried away. When the gas was fully screwed on the vision disappeared. All the forenoon, and even while relating the occurrence to me, she had the feeling that she had done something wrong; "I'm sure," said she, "that I never did anything," meaning of a criminal nature.

28th November.—This evening she had another vision. It seemed that there were many dead people in the room; she thought, also, that she herself was dead and that they were "laying her out." It soon passed away. She has often a funny "grueing" feeling all over, and a sensation as if her body had been all crushed. The least noise, such as the falling of a spoon on the floor, will make her start. For some weeks, both night and day, but particularly during the day, she has been much troubled with involuntary startings of her limbs. There is a constant ringing in both ears, and a giddy feeling compared by her to what she had once experienced in a boat pitching. Her head is often very sore and, when it is so, she has usually a bad taste in the mouth, and a smell in the nose like that of rotten butcher-meat. The pain is most severe across the forehead, but she has sometimes also a burning feeling in the back of the head. Besides the visions, she has occasionally flashes of light before the eyes.

11th December.—Patient is very anxious and agitated to-day, and has a very unhappy expression of countenance. She said, addressing me, "You're no to put me in the bog-hole to-day." Another vision was seen this morning. It was of a totally different character from the previous ones. There appeared about a dozen of people whom she knew when young, and just like what they were then. They wanted her to dance; but she told them she was not well and could not join them. She believes that they were really in the room. When told that other people did not see them, she replied, "I saw them, at any rate." Severe pain across the temples was complained of.

On the 18th December she had a vision of her dead mother, but after describing it, added "I suppose it must have been imaginary." On the 23rd of the same month she was very un-

happy, and said to me, "I'm that feared; I'm feared you're going to put me away to be executed; you're no going to put me away, doctor?"

After this the visions were more frequent. A very striking one was related to me on the 18th of January. She said, in nearly the following language,—Last night when awake there seemed beside me on a rock something like a guillotine; and a large number of people, both men and women, went forward to it, put their necks on the block, and immediately they were beheaded. As the fatal stroke fell, a voice said to her, "There's another one." All the time she was wishing that her turn would come. At the time she described the scene to me, she was quite convinced that it was imaginary.

She survived for several weeks after this note was taken, and during that time there was little change in her mental condition. After death an inspection was made, but nothing abnormal was observable, except an unusual vascularity of the brain substance and membranes, this being most striking in the smaller vessels. It is proper, however, to add that a microscopical examination was not made.

In this case it would be observed that the disorder affected vision almost alone at first, but that afterwards the other senses, the motor and the psychical functions, were all involved. The implication of the olfactory sense was shown by the smell of rotten butcher-meat; the gustatory sense by the bitter taste; the auditory sense by the ringing noises in the ears and the "voices;" and the motor function by the startings. The psychical disturbance, which was most decided in the advanced stage of her illness, was manifested chiefly by the occasional morbid depression and belief in the reality of the visionary forms.

In these disorders the irregularity in the commencement and in the order of succession of their phenomena is striking when contrasted with normal physiological sequences. In the latter, impressions coming from without pass through the inferior and, it may be, ultimately reach the highest cerebral centres in an orderly and systematic course. In disease, on the other hand,

as in epilepsy and epileptoid affections, the morbid action may begin, even in the same case, at one time, as in the *petit mal*, in the portion of brain associated with consciousness, which, from the recent researches of Luys and Meynert, would appear to be in the region of the great sensory ganglia at the base; at another time in the centre for common sensibility, as in certain forms of neuralgia; or perhaps in the motor centre, as in unilateral convulsions. But there may be an imitation of the natural order of succession, as is illustrated by a female patient who was lately under my care. In her a severe pain beginning in the thumb of the right hand and extending up the arm was followed by muscular contractions in the same arm, and afterwards by confusion of mind and incoherence in talking with partial loss of consciousness. In short, the course of nervous phenomena is such that in health a distinct correlation is obvious amongst them, while in such diseases as have been referred to in this paper the connection of their respective groups of symptoms is often broken and disorderly. Still, for each form of disorder there is a general though not constant uniformity of pathological sequence.

IX.—NOTES OF A CASE OF POISONING WITH OIL OF SAVINE.

By J. BROWN SIM, M.B., L.R.C.S.E., Nottingham.

THE following notes of a case of poisoning with oil of savine possess some interest from the fact of recovery having taken place after a large dose of the poison. According to Christison, the medicinal dose of the oil is from 2 to 5 minims. My patient must have taken 150 minims in two doses of 60 and 90 minims respectively. On the morning of the 26th June, I was called between 4 and 5 a.m. to see Mrs N—. On arriving I found her suffering from the most intense pain in her stomach and bowels. The pain she described to be constant, and “as if there was some one pulling her with all their might in different directions.” The abdomen was swollen, and tender to the touch—no strangury. She complained of great thirst, and her skin was cold and

clammy. She informed me that it was six weeks since she had had her monthly period, and, fearing she was pregnant, she had gone to a druggist, who gave her some medicine. Of that mixture she had taken two teaspoonfuls on the morning previous at 10 o'clock in some gin and after a full breakfast. From this dose she felt very little inconvenience. At 9 p.m. she took three teaspoonfuls without admixture, and on an empty stomach. Directly she had taken this dose she experienced pain in her stomach. The pain continued to increase in intensity, and about 4 a.m. she took some brandy, which made her very sick and vomit freely. The pain remained unrelieved. She gave me the bottle containing the mixture she had taken. It was a 2 oz. bottle, and was a little more than half full. The mixture separated into two apparently equal portions, the upper from its smell, etc., I recognized as oil of savine, and the lower I suspected to be the *Liq. Ext. Ergotæ*.

I at once gave her a full dose of *Tinct. Opii*. and prescribed a mixture containing *Liq. Bismuthi* and *Tinct. Opii*. in large and frequent doses. I saw her again about 10.30 a.m., and found the acute pain relieved, but she still complained of a dull heavy pain in the abdomen. In the evening she was removed a distance of nearly two miles in a cab without any increase to pain. She made a steady improvement without any symptom of abortion.

From inquiries I subsequently made I found that the contents of the mixture were exactly what I have stated above. It will thus be seen that supposing only 5 drachms to have been taken, and that she shook the bottle sufficiently to pour out equal proportions of the oil of savine and the *Liq. Ext. Ergotæ*, she must have taken 60 minims at breakfast time and 90 minims in the evening of the former drug, the latter dose having every opportunity of taking full effect, having been taken on an empty stomach.

X.—THERAPEUTICAL NOTE.

By J. CRAWFORD RENTON, M.B., ETC., Glasgow.

THE great advantages derived from opium and its derivatives are sometimes materially interfered with by the severe and annoying sickness which often follows their administration.

The recommendation of Sir Robert Christison to give a little brandy before the patient is allowed to leave his or her bed answers the desired effect sometimes, but in several cases lately where we have had to use opium pretty freely the sickness has been very distressing. We accordingly suggested that after each dose 15 grains of bromide of potassium should be taken, and uniformly the result has been a cessation of the annoying symptom, and prevention of it for the future. One patient informed us that she had never taken opium before without having severe sickness afterwards.

Reviews.

- I.—THE SUCCESSFUL TREATMENT OF INTERNAL ANEURISM BY CONSOLIDATION OF THE CONTENTS OF THE SAC. *By JOLLIE TUNSELL, F.R.C.S.I., President of the Royal College of Surgeons in Ireland.* London: J. & A. Churchill. 2nd Edition. 1875. pp. 71.

OF late years our knowledge of the treatment of internal aneurisms has made very rapid strides, so much so that this class of diseases may safely be transferred from the list of incurable to that of curable. We can now resort, with good prospects of success, to galvano-puncture: some think that the same remark is applicable to the treatment by means of iodide of potassium; and a perusal of Mr Tunnell's pamphlet leads to the conclusion that we may also look for cures by the adoption of the measures recommended by him. These have, in addition, the merit of great simplicity, and consist of absolute repose for a period of two or three months, and a very restricted diet. The diet, under ordinary circumstances, must be confined to three meals, served at regular intervals, and restricted to the following in kind and in amount, viz.:—For breakfast, two ounces of white bread and butter, with two ounces of cocoa or milk. For dinner, three

ounces of broiled or boiled meat, with three ounces of potatoes or bread, and four ounces of water or light claret. For supper, two ounces of bread and butter, and two ounces of milk or tea, making in the aggregate ten ounces of solid and eight ounces of fluid food in the twenty-four hours, *and no more.*" Details are also given as to the arrangement of the bed upon which the patient lies (at p. 64), and as to the use of remedial agents to meet special symptoms and complications (at p. 66). The pamphlet is adorned by several very beautiful coloured illustrations, and many cases are quoted in which, under the above treatment, recoveries took place. Here is one of them:—

"A hackney carman, named Doyle, aged 35, was admitted into the City of Dublin Hospital, for an aneurism of the abdominal aorta as large as an orange. He was placed under restricted diet and perfect rest in the horizontal position for three months, being allowed only 8 ounces of solid food, and 6 ounces of fluid during the twenty-four hours. The tumour soon became partially solid, so that when grasped, it imparted to the hand the idea of considerable density. The recumbent position was, however, maintained for the period stated. He was then allowed to leave his bed, and three weeks afterwards quitted the hospital, shortly subsequent to which he resumed his occupation. At the end of eighteen months I met him plying at a railway station, and hired him for the journey I was going upon. He told me that he had been 'all right' ever since he left the hospital, and was perfectly able to do all his work, with the exception of lifting a bucketful of water, which he found great difficulty in effecting, from inability to straighten his back. He stated that he never felt any inconvenience from driving, excepting when the car gave a jolt in passing over a crossing. Three years afterwards (that is, four and a half years from the time of being under treatment), I saw him again at his stand, and he told me he had been driving uninterruptedly ever since. This man died subsequently from the effects of an accident."

In conclusion, we can most cordially recommend the perusal of this brochure to those who are interested in the treatment of internal aneurism, for it contains very valuable information, pleasantly told, and in small bulk; and we may add that, having had the pleasure of inspecting Mr Tufnell's preparations in Dublin, we can endorse that which he says with regard to them.

II.—CLINICAL LECTURES AND ESSAYS. *By* SIR JAMES PAGET, Bart. Edited by Howard Marsh, F.R.C.S. London: Longmans, Green & Co. 1875.

SIR JAMES PAGET has conferred a great boon on every member of the profession by the re-publication, in a collected form, of the contents of this volume. The work is from the hand of a master, and could only have been written by one who is a profound thinker, an experienced surgeon, and a great pathologist.

The hints and cautions contained in every lecture may well be thought over by the hospital surgeon, while to the general practitioner and student they will prove invaluable.

Lecture I. treats of the "Various risks of operations," and our author states that he cannot refer us to any book in which we may learn nearly as much upon the matter as we ought to know; but more than that, we doubt if any book can ever teach us much concerning the risks of operations. The present chapter is, however, very valuable, and contains the results of much reading, of great practice, and of much thought. In treating of the risks of operations in the strong and feeble, and at different ages, the following graphic picture is given. "But among the old there are even greater differences than among the younger in the ability to recover from operations; and age, if reckoned by years, is not the only thing in them that we must estimate; years, indeed, taken alone, are a very fallacious mode of reckoning age; it is not the time but the quantity of a man's past life that we have to reckon: and for this estimate, with a practised eye, looks are less deceptive than a tale of years. . . . They that are fat and bloated, pale, with soft textures, flabby, torpid, wheezy, incapable of exercise, looking older than their years, are very bad. They that are fat, florid, and plethoric, firm-skinned, and with good muscular power, clear-headed, and willing to work like younger men, are not indeed for operation, yet they are scarcely bad. The old people that are thin, and dry, and tough, clear-voiced, and bright-eyed, with good stomachs and strong wills, bear all but the largest operations very well."

Our author then proceeds to the risks in the scrofulous, the syphilitic, the gouty, the cancerous—next of the drunkard and the teetotaler. Sir Astley Cooper long ago observed that the worst class of patients who came under his hands were the London draymen—men continually soaked in malt liquor—and in whom the slightest scratch was almost certainly followed by erysipelas. We see the same thing in our cabinen.

Lecture II. treats of risks in connection with dyspepsia, liver disease, diseases of the circulatory and respiratory systems. "Diseases of the heart are, on the whole, much less serious hindrances to recovery from operations than you might suppose. Not only so, but the operations may afford great relief and mitigate the cardiac symptoms." Some time ago we saw a lad, aged 13 years, suffering from valvular disease, orthopnoea and general oedema—he was also the subject of stone in the bladder. To all appearance the lad had only a short time to live, and the question at the consultation was, whether it would be prudent or even safe to operate under the circumstances; lithotomy was decided on, and performed by a very skilful hand, and with the greatest possible benefit. For weeks the boy had not been able to procure more than half-an-hour's sleep at once, from the continual irritation and desire to micturate. Immediately after the operation the patient fell asleep, and in two days the orthopnoea and oedema were gone, and he made an excellent recovery. The lecture terminates by giving wise rules regarding operations in cases of phthisis.

Lecture III. treats of operative risks in connection with renal and vesical disease; risks in the insane; risks during suckling and menstruation.

The calamities of surgery occupy the fourth lecture—a chapter of the greatest interest and importance. A death from chloroform is the first case referred to, and Sir James in a foot note states, that for the last two years he has used only sulphuric ether. We prefer chloroform, and proper care in its administration seems to be the only safeguard requisite—attending to the colour of the face and watching the respiration. In the course of the chapter this great surgeon shows that many untoward results cannot be reckoned accidents, and that prudence and forethought would in all probability have enabled the operator to foresee and avoid the operation which ended fatally. He gives the following amongst other cases:—"A man had albuminuria, and he had a small cyst on the scalp which it was thought advisable to remove. It was removed, and erysipelas set in, and of that the man died." If the existence of the renal disease had been ascertained beforehand, no prudent surgeon would have operated. "A man with an irritable bladder complained of symptoms of stone—he had an inflamed urethra. He was catheterized; acute inflammation of the urethra followed, and then retention of urine, acute inflammation of the bladder, and through that—death. He ought not to have been catheterized until after some few days' rest." Amongst the calamities

that we have known take the following :—Humerus fractured in attempting to reduce a dislocation of four months' standing; aortic aneurism pointing above clavicle, similar to one figured in Allan Barr's work, punctured for an abscess; aneurism of brachial artery opened for a collection of pus. Years ago, when walking the hospital, the acting surgeon asked the dresser for a bistoury; he was about to cut into a swelling in the ham which had been poulticed in the ward for some time. An older practitioner, who by chance was visiting the house, put his hand on the swelling and at once abruptly said, "Stop; give me a stethoscope." The calamity was prevented. We have also known a strangulated femoral hernia looked upon as a fatty tumour in the groin for a period of eight days, whilst ineffectual measures were being tried for the constipation and vomiting. We have known a surgeon wound a vein in the axilla while removing a glandular tumour from that situation. Phlebitis and death followed. The fingers should have been used more, and the point of the knife less.

"The consideration that you are liable to these calamities should be an incentive to the most earnest and continual study of your profession, that you may avoid all avoidable ignorance; and to constant discipline in watchfulness, that you may overlook nothing that may contribute to a patient's welfare." "Attend, then, carefully to what are called the minor things of surgery; not merely to skill in operations, large or small; learn the habit of entering completely and fully into everything that may minister to the safety and comfort of the patient."

The fifth—a curious chapter—treats of urinary stammering, and shews the strong influence of habit, and of the association of ideas in it, as in stammering of speech.

Lecture VI. "Cases that bone-setters cure." Dr Hood, in his essay, goes more fully into the same subject, but both agree with regard to the nature of the cases to which they refer.

Chapters 7, 8, 9 and 10 are devoted to strangulated hernia, and in which our author enters into the subject very fully. In the 7th chapter the signs of strangulation are laid down drawn from life. In the 8th, the different modes of reduction. In the 9th, the operation; and in the 10th chapter, the after treatment. Proofs of great experience, thought, and good sense are displayed in these chapters, which will repay the most careful study.

Chronic pyæmia takes up the succeeding chapter; then follow six chapters on Ncurmimesis or nervous mimicry. In the course of our reading we have not met with anything at all equal to what is furnished here on this subject. It is treated—as everything in the book is—in a masterly manner, and forms a com-

plete monogram on a very difficult subject. We know of nothing in the English language approaching in diagnostic power the chapters on nervous mimicry.

The remaining chapters are on "Treatment of Carbuncle;" "Sexual Hypochondriasis," a chapter of rare excellence; "Gouty Phlebitis;" "Residual Abscesses;" "Dissection Poisons;" "Senile Scrofula;" "Scarlet Fever, after operations."

The last chapter consists of a study of constitutional diseases—bringing to a close a work which all may read with pleasure and profit. In this chapter is mentioned the case of a gentleman aged 75, who for twenty-five years took five grains of Plummer's Pill every night! He must have been a disciple of Calomel Currie.

The book needs no praise, and is beyond the pale of criticism.

III.—ON PARALYSIS FROM BRAIN DISEASE IN ITS COMMON FORMS. *By* H. CHARLTON BASTIAN, M.A., M.D., F.R.S. London: Macmillan & Co. 1875.

DR BASTIAN has long held a very high place among our *savans* as a careful and trustworthy observer, as an experimentalist of great accuracy, and as a clear and philosophic thinker. It is now many years since by his paper on the specific gravity of the human brain his scientific reputation was at once fully established, and since then his numerous contributions to medical and other journals on subjects so diverse as aphasia and the germ theory of disease, his papers in Reynolds' "System of Medicine" and his book on the "Beginnings of Life" have more than sustained the anticipations which were then formed of him. His labours in the more abstruse departments of medical science have been so weighty and valuable that it might perhaps be supposed he did not devote himself at all closely to the practice of his profession. This, however, would be a great mistake. From personal observation we know that at the hospital for the paralytic and epileptic (besides in private and other public practice) he diligently observes and prescribes for the diseases which are there treated. In that institution there is a field for the study of these disorders unequalled at all events in the United Kingdom; and the present treatise, we doubt not, is mainly the fruit of the experience acquired during his connection with it as a physician.

A work on paralytic disease was really much needed. There has been no systematic publication on that important group of affections since the late Dr Todd's well known lectures appeared.

It was a most meritorious production and may still be read with profit, but our acquaintance with the physiology and more especially the pathology of the brain has so greatly increased since that physician's day that the want of a treatise representing the present state of our knowledge had come to be much felt. Were it only to present us in a concise form with a record of the important observations of MM. Bouchard and Charcot on miliary aneurisms as a cause of cerebral hæmorrhage, with those of M. Bourneville on the aids to pathological diagnosis and to prognosis derived from a consideration of the temperature in the different forms of apoplexy, and with the respective value of different symptoms in forming a correct regional and pathological diagnosis, the *raison d'être* of the book would be fully established. But besides discussing these questions it contains all the recent information which modern research has contributed towards the elucidation of the other problems presented by cerebral paralysis; all being critically considered, and much fresh light thrown on them from the author's experience.

The work is divided into eight chapters and is in the form of lectures, the substance of them having been delivered in University College Hospital during the course of last year. Chapter first deals with the causation of hemiplegia resulting from apoplexy, or, at least, when it is of rapid onset—rupture of vessels, occlusion of vessels, and spasm of vessels being considered in succession. The scope of the book does not lead the author to describe paralysis arising from cerebral tumours and other usually slowly acting causes. In speaking of cerebral softening due to occlusion, he mentions that "should death occur within forty-eight hours from the onset of apoplectic or hemiplegic symptoms no softening may be discoverable, simply because there has not been sufficient time for this pathological condition to become established." But though this is true and important to bear in mind, it is not stated that in such a brain the area of cerebral substance supplied by the occluded vessel would be found highly anæmic. A case of this kind occurs to the present writer, in which death followed the apoplectic seizure in a few hours. On *post-mortem* examination the middle lobe of the affected hemisphere was almost milk-white and contrasted strongly with the corresponding part of the other hemisphere. In treating of softening, no reference is made to the decrease in the specific gravity of the white substance, though this is usually a striking feature of the softened parts.

At the close of this chapter Dr Bastian devotes a short space to hysterical hemiplegia, but he does not mention reflex hemi-

plegia. This, though of very rare occurrence, we believe that we have seen, and the possibility of such an event should be borne in mind.

In treating in chapter second of heredity in relation to the causation of apoplexy, the author has not found in his experience that it exercises much influence, or, if it does, he is of opinion that the history obtained does not show it. This is our experience also as derived from inquiries respecting a considerable number of cases, though in a few instances where one or other of the parents was apoplectic it may possibly have operated as a cause. Following this subject, there is an excellent description of the vascular supply of the brain in its relation to the symptoms produced by lesions in different regions, embodying the results of the researches of Heubner and Duret. Thereafter the premonitory symptoms of apoplexy are discussed. The author's statement that these are *often* absent altogether seems rather strong. Doubtless, where embolism is the cause, no indication of the impending seizure can have shown itself; but when the cause has been within the brain itself it is seldom in our experience that careful inquiry fails to reveal that, at least for a brief period previously, there had been some disturbance of motion, sensation or intelligence. The most common premonitory symptom that we have noticed is a feeling of *giddiness* which may or may not be associated with one or more of the other prodromata that are not infrequently observable.

As has been indicated, M. Bourneville's valuable conclusions respecting the diverse effects of different cerebral lesions on the temperature of the body are detailed by the author, but at the same time he cautions the reader against accepting them unreservedly until they have been corroborated and probably modified by a more extended series of observations.

We must confess to have experienced some surprise in finding the statement, in chapter third, respecting the typical hemiplegic state, that "*the mental condition continues undisturbed, or at most, there is a slight weakness of the general mental power of the individual.*" Now, while freely admitting that cases are occasionally met with, particularly under middle age, where no enfeeblement of mental power is noticeable, we are inclined to think that such cases are by no means common and that, on the contrary, in most cases there remains more or less impairment of the intellect, even where the lesion is situated where the author in illustrating the "*typical condition*" supposes, namely, in or just outside the right corpus striatum. This mental defect may perhaps not readily be noticed by the observer, but the patient himself feels and usually freely admits

that his capacity for sustained attention and memory are not equal to what they were previous to the attack.

In lecture fourth, when discussing the degrees and modes of sensory impairment in hemiplegia, the generally accepted hypothesis, originally advanced by Dr Broadbent in explanation of the escape of the bilaterally acting muscles in that condition, is extended to the sensory power. That hypothesis, it will be remembered, is based on the supposition that the nerve nuclei on opposite sides of the cord of such pairs of muscles are so intimately connected by means of commissural fibres as to be in fact a single nucleus. Dr Bastian holds that "conversely in the case of sensory phenomena, we seem to have double ingoing impressions impinging on sense organs on each side of the body, conveying to double and united sensory ganglia, and being then taken cognisance of by a single cerebral hemisphere, when it happens that the other is seriously damaged." This appears to be a perfectly legitimate application of the principle, and it helps us to a clearer conception than we could otherwise have of the probable cause of the escape of certain sensory nerves and the implication of others in the hemiplegic state.

In the same lecture the opinion is expressed that the lower ganglia or sense centres for common sensibility are situated on either side of the upper or posterior part of the pons varolii, and certainly many pathological facts lend support to the views that these centres are, at least, not in the thalami optici, as so long supposed. But on the other hand, according to the recent experiments of Dr Ferrier (the results of which were communicated at the late meeting of the British Medical Association), destruction of either the thalamus opticus or the hippocampus minor produces anæsthesia. We must, therefore, refrain from coming hastily to a conclusion on this question.

In lecture fifth there is an excellent exposition of the various defects of speech and, generally, of the aphasic state which is so often associated with hemiplegia of the right side. The views expressed are the same as those published at greater length by the author in the *Medico-Chirurgical Review* for 1867, and that communication may be said fairly to represent our present knowledge of aphasia, as no material addition has been made to it since the date of Dr Baidieu's publication. At the close of this chapter reference is made to those anomalous cases in which paralysis or convulsions of one side, and particularly the left, were associated with lesions of the same and not of the opposite hemisphere. The author has no explanation to give regarding such cases, but at the same time he reminds the reader that "the fibres in the outer part of the

anterior pyramids of the medulla do not decussate—they descend in the anterior columns of the cord on the same side.” In connection with this subject it is perhaps worthy of remark that, at the recent meeting of the British Medical Association, M. Dupuy (whose objections to the location of motor centres in the convolutions lately attracted some attention) stated that he had found, as the result of a somewhat extensive series of experiments on the lower animals, that lesions on the surface of one hemisphere often produced a degree of paralysis on the *same* side of the body, but that when a similar lesion was produced on the opposite hemisphere the animal apparently recovered its original power and neither side was then affected! These observations, we should think, stand very much indeed in want of being corroborated.

The chapters in the work which in all probability will be most consulted are those on regional and pathological diagnosis. The indications both in respect of the locality and the nature of the lesion derivable from the symptoms are clearly stated, the fruits of recent researches being carefully collated in relation to the subject. Even those who are familiar with the conclusions from their readings in the *Journals* where the papers embodying them were published will be pleased to have them here in a convenient form for reference.

In the closing chapter we have, besides the prognosis, the author's views on treatment both preventive and of the apoplectic state, and these we consider to be highly judicious. No routine measures are prescribed: a careful diagnosis of the pathological condition is counselled before determining on the line of treatment. This may include stimulants, should a feeble heart's action, diseased arteries, and other symptoms indicate thrombosis; or possibly blood-letting and other antiphlogistic measures may be used should an opposite condition exist. In our own practice we have given even alcoholic stimulants in the former condition and have bled at the arm in the latter, with favourable results in both cases.

It will be evident from the preceding observations that, as a whole, we have formed a high estimate of this work. No one should omit reading it who wishes to keep abreast of recent progress in the difficult department of cerebral disease. It is clearly written, the author's meaning being never obscure; and while presenting us with the rationale, wherever that can be given, it is thoroughly practical. We should state that the plates at the end of the volume, showing the cerebral convolutions and the distribution of the cerebral arteries, are useful additions.

IV.—COMMENTARY ON THE BRITISH PHARMACOPŒIA. By WALTER G. SMITH, M.D., (Dubl.), F.R.Q.C.P.I. London: Smith, Elder & Co. 1875.

THIS is one of the best compendiums of materia medica which we have seen. It is equally distinguished for correctness and clearness, and but for one fault would, without doubt, soon be one of the favourite text books for students preparing for the higher examinations. The fault we allude to lies in the arrangement. As a commentary on the British Pharmacopœia, it follows, to some extent, the method of that book, and while thus it may possibly be a most useful work for pharmacutists, we are afraid it yet must prove too confusing for medical students and practitioners, the cross references are so numerous and perplexing. Had the arrangement only been the systematic one adopted in most manuals of materia medica, the "commentary" under that, or any other title which its author might have chosen, would soon have made good its position. As it is, it can hardly be expected to become more than a book of reference.

In the preparation of the "commentary" great pains have evidently been bestowed. The greatest attention has naturally been paid to the chemistry of the various drugs, and their chief reactions and tests in the pure and adulterated states. Indeed, in no other text book of our acquaintance are the reasons for the various combinations and the uses of the several constituents in the preparation of Galenical formulæ more fully shown. The relations also of the various compounds, for instance of the metals, are illustrated by synoptical lists and "genealogical" tables, so as in most instances to be seen at a glance.

The therapeutical part of the book has also been very carefully worked out, and for clearness, conciseness, and accuracy is all that the student can require.

V.—THE VETERINARY JOURNAL AND ANNALS OF COMPARATIVE PATHOLOGY. Edited by GEORGE FLEMING, F.R.C.S., *Veterinary Surgeon, Royal Engineers*. Nos. 1 and 2. July and August, 1875. London: Baillière, Tindal & Cox.

IT has too long been a reproach against veterinary surgeons, and especially against the teachers of veterinary science, that with their splendid opportunities for observation and for gaining experience, they have not been apt to teach by their writings their less favoured brethren. And the reproach has been only too well founded. Veterinarians, deterred no doubt in great measure by the fear that it would not pay, have been too much in the habit hitherto of hiding their light under a bushel, and of confining

their valuable professional experience within the walls of their own college. Every one has regretted this, and none more than the members of the medical profession. In these days when comparative anatomy, physiology, pathology, and therapeutics are being daily appealed to for the purpose of enlightening us as to the nature, causation, and treatment of disease, it has always been felt by investigators that their observations were far from being complete or satisfactory, in the absence of that confirmation or disproof which was alone to be obtained from comparison with clinical and pathological records. It was therefore with no slight pleasure that we welcomed the *Veterinary Journal*, conducted by such a well-known physiologist and pathologist as Mr Fleming; and now, after the perusal of two numbers, we have the greatest confidence in saying that if it only maintains its present standard of excellence it will be highly prized, not only by veterinarians, but by all whose aim it is to relieve the sufferings of man and beast.

VI.—LESSONS ON PRESCRIPTIONS AND THE ART OF PRESCRIBING. *By* W. HANDSEL GRIFFITHS, Ph.D., L.R.C.P.E. Macmillan & Co. 1875.

THIS little book seems to be eminently adapted for the use of students, and supplies a very decided want in the professional training of some schools. The arrangement is excellent, and not only does the author indicate the dose of a medicine, its incompatibles, and the best methods of combination, but he also gives many useful hints as to the action of the drugs and the indications for their administration. Many prescriptions are given which will be found very useful. We heartily commend the work to the attention of students.

VII.—NOTES ON THE TREATMENT OF SKIN DISEASES. *By* ROBERT LIVEING, A.M., M.D., *Physician to Middlesex Hospital, in charge of the Cutaneous Department.* Third Edition. London: Longmans, Green & Co. 1875.

THIS little book is worthy of all praise as far as it goes, and gives a very fair digest of the treatment most appropriate for the cure of the various affections of the skin. We are surprised, however, to find that no notice is taken of the treatment of psoriasis by means of india-rubber coverings, and by tarry preparations administered internally. The author, too, seems to give to the term "lepra" a construction quite different from

that of other physicians, and he speaks with a too uncertain sound as to the essential dependence of the vegetable parasitic affections upon their fungous growths.

In future editions we would strongly advise the introduction of an index, but meanwhile we can cordially recommend the present one.

VIII.—THE SKULL AND BRAIN: THEIR INDICATIONS OF CHARACTER AND ANATOMICAL RELATIONS. *By* NICHOLAS MORGAN, Author of "Phrenology; and how to use it in analysing character." Longmans, Green & Co.

THIS little work, which is dedicated to Dr W. A. F. Browne, Psychological Consultant to the Crichton Lunatic Asylum, reflects credit on its author as regards clearness of statement and an absence of extreme views. The various divisions of mind approved of by phrenologists have many objections, and these do not seem to have been answered by the author of this work. There is no decided place given to Memory, Reasoning, and Judgment, although their importance is touched upon and the hope expressed that phrenology will localize them. There are many of man's special propensities not included, for example running, swimming, walking, &c. We prefer the more comprehensive and rational divisions of mind which have been made by our recent philosophers, Hamilton, Stewart, and Brown.

There are no facts to point out conclusively that Memory, Consciousness, &c., are localized in any special convolution, but investigation seems to show that, by the beautiful arrangement of the human brain, the different parts aid each other, and by a division of labour the admirable results of brain exertion are produced.

Although more inclined to agree with Sir Wm. Hamilton in his able lecture on the subject, still we would recommend the study of it to all, and from no book will they obtain a more clear and concise statement of the condition of the System than from the one before us.

IX.—A PRACTICAL TREATISE ON DISEASES OF THE EYE. *By* ROBERT BRUDENELL CARTER, F.R.C.S., *Ophthalmic Surgeon to St George's Hospital.* London: Macmillan & Co. 1875.

OUR estimate of Mr Brudenell Carter's book will depend greatly on whether we regard it as a complete treatise on eye diseases, or simply as a collection of essays on important ophthalmic subjects. The title it bears would incline us to take the former

view, but it is so deficient in systematic arrangement, and there are so many important subjects which receive no notice, that we feel we should do injustice to the sterling merits which the book possesses if we judged it from this standpoint. We prefer then to consider each chapter as a separate essay, especially as many of the chapters were published as detached papers in the pages of the *Practitioner*, and *St George's Hospital Reports*, before they were gathered into the present volume.

The anatomical introduction is chiefly remarkable for its brevity, simplicity, and intelligibility, qualities which are commonly conspicuously absent in such introductions to treatises on the diseases of special organs, specialists having a lamentable tendency to magnify unimportant details, and give undue prominence to imaginary microscopic appearances. Yet with all his brevity, the author does not omit to describe the papillary and glandular structures of the conjunctiva, the particulars of the vascular supply of the ball, and the distribution of the different ciliary nerves, subjects which, from their especial bearing upon pathological processes, deserve more attention than they ordinarily receive at the hands of anatomists, or even of many writers on eye diseases. The physiological description also, which forms part of the same chapter, is not confined to a discussion of the *modus operandi* of accommodation, and an elucidation of the mysteries of spherical and chromatic aberration, but very properly includes some remarks on the inversion of the retinal image, the effect of shortening or lengthening the optic axis, presbyopia, direct and indirect vision, and other kindred subjects. Mr Carter is as fully impressed as Helmholtz himself with a sense of the numerous imperfections which the eye contains, and does not fail to catalogue these at length; he reminds us that the eye is not achromatic, that its curved surfaces are very irregular, and hence all persons are really astigmatic; that the crystalline lens is fibrillated, and for this reason breaks up distant points of light into rays, and that the media are not homogeneous. Nor does this end the catalogue, for the retina itself has defects of no mean order, it has one large spot (optic nerve entrance) which is totally blind, and the large retinal vessels also produce "blind lines;" its most acutely sensitive portion, the yellow spot, differs in colour in different persons, and modifies considerably the apparent colour of an object looked at; and finally, it is very faintly sensitive to red rays. No wonder then that the author should conclude that "even in its normal construction the eye is full of faults, which would condemn a telescope or a microscope to be thrown aside as useless." But we are much relieved to find that he is of

opinion that these faults are neutralised in the living organs "by the conditions under which it is exerted, as well as by a variety of physiological compensations."

The chapter on the ophthalmoscope and its applications is, in our view, chiefly remarkable for the high value which the author sets upon the direct method of examination, a method which, while it has been almost exclusively used in Glasgow, has never received in London, and on the Continent, the attention which it so fully deserves. The author of a very convenient and generally admirable manual of ophthalmoscopy recently published in France,* (V. Daguene) seems to be in doubt as to whether it is possible to examine the emmetropic eye by this means, if we may judge from the following sentences:—"Avec le miroir on ne peut obtenir aucune image distincte du fond de l'œil emmétré, si ce n'est dans des conditions tout à fait particulières, tandis qu'on peut voir l'image réelle et renversée de l'œil myope et l'image droite et virtuelle de l'œil hypermétrope. Les services que rend le miroir sont donc limités et variables." Most of the difficulty experienced by those unaccustomed to the use of the mirror alone depends: 1st, on the patient being told to look at a near object instead of a distant one, by which course the pupil becomes contracted (unless atropine has been used), and the eye becomes capable of receiving only diverging rays; 2nd, on the necessity for the relaxation of the observer's own accommodation; and 3rd, on the eye of the observer not being brought near enough to that of the observed. If the eye of the patient, which is not under examination, be directed to a distant object, the observer will, after a little practice, be able to relax his own accommodation, and so fit his eyes for the reception of parallel rays; both eyes being now at rest, the details of the fundus of the observed eye will be brought before the observer with a clearness which can never be obtained with the indirect method, and the smallest changes in the disc and retina be at once noted. Mr Carter thus describes the circumstance under which each method should be used:—"In the emmetropic eye not only is no auxiliary lens required for the erect image, but none can be borne; and clear definition is only obtained when the eyes of patient and observer are closely approximated. In the myopic eye, a clearly-defined image cannot be obtained at any distance, until a concave lens is interposed; and this lens is most conveniently placed behind the mirror. In the hypermetropic eye an erect image can be obtained without a lens, and at some little

* *Manuel D'Ophthalmoscopie. Diagnostic des Maladies de L'œil.* Par M. le Dr V. Daguene. Paris: G. Masson. 1875.

distance; but when the eyes are closely approximated this image is still seen, and it becomes better defined if an appropriate convex lens is placed behind the mirror."

For the resolution of corneal opacities the author has confidence in the subconjunctival injection of a solution of chloride of sodium, a method which was first suggested by Professor Reithmund of Munich. The solution is used of the strength of ten grains of the salt to an ounce of distilled water, and five to ten minims of it are injected between the sclerotic and conjunctiva by means of a common hypodermic syringe. We have not ourselves given this method a trial, nor are we acquainted with the supposed rationale of its action; the most effective treatment of these opacities with which we are acquainted is the daily insufflation of finely levigated calomel, which seldom fails in notably diminishing the size and density of the speck.

While very doubtful of the advantages claimed by M. de Wecker for his operation of "iridotomy," considering the risks to be much greater than those of an iridectomy, and the result not commonly so good, Mr Carter credits himself with the introduction of a great improvement on that gentleman's method. He makes a very small corneal incision through which he introduces Wecker's scissors with closed blades; when the points reach the pupillary area he allows the blades to expand, when "an escape of aqueous lifts a pleat of the iris between their edges, and this pleat is excised as they are closed." This operation seems to us to present two prominent objections. It is, in the first place, much more difficult than Mr Carter would have us believe to get the required V-shaped piece of iris included between the blades; and, again, it is by no means satisfactory to require to leave the detached bit in the anterior chamber to escape as best it may. Our author meets the second objection by the statement that he has never had any difficulty in getting the bit away, but that Messrs. Weiss are constructing for him a pair of "special scissors furnished with minute teeth, and intended to hold and remove the piece as it is cut." The chief advantages of this operation seem to be the smallness of the opening required, the fact that the iris is not dragged upon or drawn out of the wound, and the large pupil which is obtained by the excision of a small bit of iris; but in view of the simplicity and harmlessness of the ordinary operation of iridectomy it is scarcely probable that Mr Carter's "modified iridotomy" will to any considerable extent supersede it. As regards De Wecker's original operation, it is well adapted for cases in which an opaque capsule fills up the pupil, and can be incised with the iris, especially when the iris is tied down to the

capsule by adhesions, so as to render difficult the ordinary operation of iridectomy. It may also be of service in cases where the iris is adherent to the cornea, and it is desirable to liberate it in order to "let more light" into the eye.

The chapter on cataract contains an interesting account of the conditions which may be mistaken for that disease, the following anecdote indicating very pointedly the liability to mistake chronic glaucoma for cataract—"I was once asked, by an accomplished physician, to go some fifteen or twenty miles to perform cataract extraction upon a patient whom I had never seen. I expressed a wish that the patient should visit me in the first instance, so that there might be no question about the diagnosis on the day of operation; but to this proposal my friend demurred, saying that I might surely rely on him in so simple a matter. I carried my point, and he brought me an elderly lady who was almost blind, and whose pupils were of a curiously milky aspect. She had simply chronic glaucoma, with some atrophy of the choroid as well as of the optic nerves, so that the light entering her eyes was returned from white surfaces of considerable extent. But I was able to prove to the physician, by the aid of a demonstrating ophthalmoscope, that her lenses were as clear as his own, and to show him the finest details of her optic nerves and retina." Now that we have the ophthalmoscope to appeal to in case of doubt, all such mistakes should become things of the past. "*Nous avons changé tout cela.*" says our author triumphantly. "By the aid of the ophthalmoscope, the bare fact of the presence or absence of cataract, in the former case even in its earliest stages, may be discovered with such readiness and certainty that no doubt can be felt on the point by any but the most unskilled or careless observer." As regards the treatment of cataract, the author always practices suction after division of the soft variety, excepting in infants, or where the lens is so fluid as to admit of being drawn off by simple paracentesis. He has, however, within the last twelve months considerably modified his opinion of suction, for he has met with several cases in which it has been followed by plastic iritis and even by panophthalmitis, so that he now speaks of it with somewhat diminished confidence, although still believing that in most cases it is preferable to any other mode of treatment. With regard to hard cataract, the author deprecates waiting until the cataract has matured in cases where the patient has to depend upon his sight for a livelihood, considering that the "advantages of maturity might be more than counterbalanced by the disadvantages of a debility artificially produced by anxiety and privation;" in other cases he would proceed to operation so soon

as the cataract in the one eye became matured, although that in the other was in a comparatively early stage, so as "to gain three benefits—first, that the patient should be relieved, once for all, of the fear of blindness; secondly, that he should never become blind; thirdly, that the operated eye should have time for the complete recovery of sight before it was taken into use." His mode of operating may be described as a "modified Graefian method." He uses a linear section knife, and enters it just behind the margin of the cornea and "on a line two millimetres below the horizontal tangent," makes his counter-puncture at the corresponding point on the opposite side, then directs the edge of the knife a little forward and cuts out, so as to make the centre of the incision at the sclero-corneal junction; this section only occupies about one-fourth the circumference of the cornea, and, while closely resembling that of Von Graefe, is less oblique and altogether on an anterior plane to the latter.

Mr Carter has almost unbounded faith in the operation of iridectomy for the cure of glaucoma. He does indeed admit that there are "individual cases" where the issue is unfortunate, but considers these as phenomenal, and is of opinion that "surgery has won few greater triumphs than the inclusion of the whole glaucomatous class of cases among the maladies which admit of cure by operation." He, however, clearly recognises that much will depend on the duration of the disease, and the secondary changes which have resulted from the increased intra-ocular tension. So long as the suspension of function is due to pressure and congestion alone, the operation will be attended with the best results, and the restoration of vision will undoubtedly follow; but should the disease, "either by pressure or the arrest of capillary circulation," have induced atrophic change in the retinal tissue, iridectomy will relieve tension and prevent further change, but will be powerless to restore the function of the atrophied tissue, and will not result in the improvement of sight. Nevertheless, our author still thinks that "there never can be any question with regard to the course to be pursued in every instance in which intra-ocular hyper-secretion is discovered. It matters little whether high tension declares itself to the touch, or is partly concealed for a time by the yielding of the disc or of the sclerotic. Such yielding is in itself highly prejudicial, and must of necessity soon reach its limit. As soon as a state exists which can be called glaucomatous, iridectomy should be performed without unnecessary delay, and even when vision is lost, the operation will afford the best means, short of enucleation, of relieving pain. In acute glaucoma we must no longer measure the available time by days, but by hours; and in the

'fulminating' form the delay even of an hour may be fatal to all hope of restoration of sight." This statement is rather a contrast to that of another London ophthalmic surgeon, whose treatise on eye diseases we had occasion to review in the July number of this *Journal*. Mr Haynes Walton says: "It is my judgment that iridectomy possesses no advantage over any other operation practised for glaucoma, by which the tension of the eyeball is reduced, and through which the engorged intra-ocular blood-vessels are enabled to be relieved. I believe that this result is best ensured by frequent tapping."* There have recently been published, in the pages of the *Lancet*, the notes of some cases of glaucoma, under the care of Mr Henry Power, in which iridectomy had been performed with very slight (if any) amelioration of the symptoms, and which convinced us that few even of the most eminent ophthalmic surgeons would feel justified in indulging in the ecstatic gratulation which distinguishes Mr Carter's account of the operation and its results. It is quite possible that the reason of his success is that he operates at an earlier stage than most surgeons, and thus prevents changes which others try to remedy: but even allowing for this, we have some suspicion that he slightly exaggerates the merits of an operation which is evidently a favourite with him.

Mr Carter has done good service to British ophthalmology by his masterly translation and annotation of Zander's "*Augenspiegel*," and Scheffler's learned optical work, he has shown his ingenuity in the construction of a portable and convenient periscope, and of a simple but very efficient demonstrating ophthalmoscope, and we have now to thank him for giving us, in the work at present under review, a *videmus* of the theory and practice of the modern (or as it is somewhat contemptuously styled, the German) school of ophthalmology. While we are far from regarding all the modifications in the mode of operation introduced of late years by Continental oculists as real improvements, we are sure that no unprejudiced person can carefully peruse the essays which compose this work without arriving at the conclusion that the advance claimed for the science of ophthalmology in recent years is by no means fictitious, but that our knowledge both of the diseases of the eye and the most effective modes of treatment, has received most remarkable and valuable additions.

* A Practical Treatise on the Diseases of the Eye. By Haynes Walton, F.R.C.S. Third edition, page 1170.

Exchange Journals.

—o—

By DR JOSEPH COATS.

VIRCHOW'S ARCHIV, VOL. LXII.

PART 4. FEBRUARY 1875.

CONTENTS.—XXII. A double monster, by E. Kortüm, Greifswald (Plate VI.). XXIII. A varicose aneurism, a contribution to our knowledge of stratified thrombi, by Professor V. Czerny, Freiburg (Plate VII.). XXIV. A peculiar pathological change in the mucous membrane of the dog from *tænia cucumerina*, by Dr P. Schiefferdecker, Strasburg (Plate VIII.). XXV. On the condition of the walls of the blood-vessels during the emigration of white blood corpuscles, by Professor J. Arnold, Heidelberg (Plate IX.). XXVI. Investigations on bacteria, by Professor C. J. Eberth, Zürich (Plate X.). XXVII. On the distribution of the gustatory bulbs in man, by Arthur Hoffmann, Darmstadt (Plate XI.). XXVIII. Subdivision of the curve of the sphygmograph into smaller units of time, by means of the spark inductor, by Dr Grashey, Deggendorf (2 woodcuts and Plate XII.). XXIX. The absorption of blood in the anterior chamber of the eye, by Dr Max Knies, Heidelberg. XXX. Oxyphic acid (Brenzkatechin) in the urine of a child, by Professor W. Ebstein and J. Müller. XXXI. Smaller communications. 1. Preputial calculi, by Dr F. W. Zahn, Strasburg. 2. Table of the swine killed and examined for trichinæ at Rostock in 1874, by Petri. 3. Observations on the hen's egg as to the third germinal layer in relation to the yelk-sac, by Hans Virchow, Berlin. 4. On circumscribed keratitis, by Professor A. Boettcher, Dorpat. 5. Remarks concerning the experimental contributions on transfusion of Professor Ponfick, by Dr L. Landois, Greifswald.

XXIII. The Sac of a Traumatic Varicose Aneurism (Czerny).—This is a case of considerable interest both surgically and pathologically. Its surgical interest consists chiefly in the fact that here, from a wound in the thigh, a varicose aneurism was produced. It appeared that the instrument, an open pocket knife, on which the patient fell, had penetrated deeply, and wounded both the artery and vein, producing an aneurismal swelling in the lower third of the thigh. It was not known at first that the aneurism communicated with the vein, and the femoral artery was tied in Hunter's canal. The open communication with the vein made this operation unsuccessful, and at

last the sac was opened and both artery and vein tied. During the operation a portion of the sac was excised for microscopic investigation, and here begins the pathological interest of the case. It may be remarked, before leaving the surgical part of it, that the patient ultimately did well. The point to be decided by the examination of the sac-wall was whether it was composed of fibrine or of connective tissue. It used to be thought that the sac of a traumatic aneurism was composed of connective tissue, but recently it has been asserted that it consists essentially of firm fibrine, at least in recent cases. According to this case it seems as if the wall were at first composed of fibrine, which is gradually replaced, first by granulation tissue and then mature connective tissue; that is to say, the sac externally consisted of firm connective tissue, between which and the fibrine which lines it, there was a cellular layer like granulations. This latter seemed to be growing into and replacing the outermost layer of clot, whose fibrine and red blood corpuscles were mostly absorbed, but might in part go to form the intercellular substance. Along with the formation of this granulation tissue, blood-vessels are formed, but these are preceded by serous channels similar to those found by Thiersch in granulating wounds. Both the blood-vessels and channels could be injected by puncture. The granulation cells are migratory cells according to the author, and they seem to take up the remains of red blood corpuscles, and so form pigment cells which are found on the wall of the sac.

XXIV. Alteration of Intestine of Dog from Tape-worm (*Schistifer decker*).—This alteration seems to be due to the irritation of the parasite, and consists chiefly in a hypertrophy of the villi, with atrophy of the glands, and thickening of the submucous tissue. The pressure of the worm causes atrophy of the glands, and at the same time irritates the neighbouring tissue, leading to elongation of the villi, and inflammatory increase of the connective tissue, which causes still further atrophy of the glands. The hypertrophied villi come by and bye to meet over the worm, and cause a portion of it to lie in a tunnel, this being still further assisted by the depression from the atrophy of the glandular layer.

XXV. The Walls of the Vessels during Emigration of White Corpuscles (*Arnold*).—This author has already investigated the walls of the vessels in cases where the red corpuscles escape, that is in diapedesis. (See this *Journal*, Jan. 1874, p. 133, and July 1875, p. 390.) As in the former case he found that the red blood corpuscles escaped at the meet-

ing points of the endothelium or stigmata, so in the present instance he finds that the white blood corpuscles also escape at such stigmata. There are certain differences, however, in the two cases. Diapedesis (escape of red corpuscles) occurs chiefly where the blood in the vessels is at a high pressure, and the stigmata are often enlarged so as to form stomata. These are cases in which venous congestion has been produced by ligature of the veins or otherwise, and the red corpuscles are forced through the stomata by the pressure. Emigration (escape of white corpuscles) occurs in the early stages of inflammation, and the author observed it in the tongue, urinary bladder, and mesentery of the frog. Here there is no such great increase of pressure, although there is some. This may be the reason that the red corpuscles do not escape, they flow down the centres of the vessels, and there is not pressure enough to divert them from their course as in the former case, but the white corpuscles are lying along the sides of the vessel, and more ready to pass out. He found that solid granules of vermilion, or a gelatine injection material, could also be made to pass out at the stigmata, and fill the serous channels in cases where emigration had been going on. These serous channels had a different configuration in cases of emigration from that in cases of diapedesis, being in the latter broader and more bulging than the former.

XXVI. Bacteria on Skin (*Elberth*).—This author has found bacteria in the sweat of all regions of the body. He also finds them often on the hair, and not only on the surface of the shaft, but penetrating beneath the external layers. Coloured bacteria occasionally occur on hairs, producing an alteration of the colour of the hair of the body. Such coloured bacteria are also occasionally present in the sweat, producing coloured sweat, as for instance, yellow or blue. The author gives drawings of the bacteria.

XXVII. The Distribution of Gustatory Bulbs (*Hoffmann*).—This is a long investigation on the distribution of these structures in the human subject. The conclusions are summarised at the end of the paper, and it may be stated generally that he finds the taste bulbs wherever taste exists, and that they are the more numerous the better taste is developed in any locality.

XXX. Peculiar Pigment in the Urine (*Elstein and Muller*).—The child to which this observation refers was to appearance perfectly healthy. During the first few days after

birth, nothing peculiar was noticed in the urine. On the ninth day after birth jaundice occurred, which lasted 10 or 12 days, after which the mother observed the following peculiarities of the urine:—The wetted cloths were at first much as usual, but after some hours a purple or burgundy colour was developed. At the wash (that is, when treated with alkaline soap) they took on a darker colour. The urine also seemed to act on the cloth, making it, according to the mother's statement, soon rotten. It was difficult at this early age to obtain the urine in any abundance, but when a small quantity was got it presented similar conditions to what it does at the time of writing this paper, when the child is already $1\frac{1}{4}$ years of age. Urine can now be got in considerable quantity, and has been submitted to a most careful analysis, with a view to separation of the colouring matter. The urine when passed appears normal in colour, but when exposed to the air it gets gradually darker and darker red, till it is the colour of burgundy. It was always acid in reaction, and when an alkali was added, it became brownish or brownish black. Boiling did not alter it, and there was neither albumen nor tubercles. From the chemical investigation the authors conclude that the substance is Brenzcatechin or oxyphic acid, a substance which is found in catechu, kino, crude wood vinegar, and the leaves of *Ampelopsis hederacea*, wild vine. It has also been found when starch, cane sugar, milk sugar, or cellulose is heated with water in a sealed tube to 200-280° C. for 4-6 hours.

XXXI. 1. Preputial Stones (*Zahn*).—These occur in cases of phymosis, and may be true urinary concretions, or may owe their origin to inspissated secretion.

XXXI. 4. Circumscribed Keratitis (*Boetcher*).—The author seems to convict Cohnheim out of his own mouth, of at one time denying and at another asserting the existence of a central circumscribed inflammation of the cornea. He brings forward a number of new experiments to support his own view, and some of them are rather striking. It may be remembered that Cohnheim asserts that after irritation of the centre of the cornea the signs of inflammation generally appear first at the margin, and if they occur first at the centre this is due to the secretion of the conjunctiva passing into the cornea through the injured spot. The present author controverts this, and we shall just mention one experiment with which he meets Cohnheim, although there are several others. He excises the nictitating membrane of a frog and allows the wound to heal. He then irritates the

centre of the cornea with chloride of zinc or sulphuric acid, and puts the frog in such a depth of water that it needs to raise its head in order to breathe. Except when breathing the animal keeps the head near the bottom of the vessel, so as to shield it from the light apparently, and the eye is thus continually washed with water. It is difficult to imagine that, with the absence of the nictitating membrane and this continual ablution, any secretion can accumulate in the conjunctiva, yet in spite of this the central inflammation of the cornea proceeds just as in the same animal under other conditions.

VOL. LXIII. PARTS I. AND 2. APRIL, 1875.

CONTENTS.—I. A review of the question of transfusion, by Professor P. L. Panum, M.D., Copenhagen. II. Anatomical notes continued, by Dr W. Gruber, St Petersburg. 1. Appendix on the bone of the frontal fontanelle (Plate I, Fig. 2.) 2. The floor of a pit for Pacchionian granulations, projecting externally as a large protuberance. 3. Enormously deep fossæ maxillares. 4. Ossification in unusual situations. 5. Retention cyst in front of epiglottis (Plate I, Fig. 1). A forked gall duct, ductus cysticus bifurcatus. 7. A case of cystic dilatation of the vermiform appendage (Plate I, Fig. 3). III. An abnormal canal for the arteria temporalis profunda arising from the arteria meningea media within the skull, by Dr W. Gruber (Plate II.). IV. On the changes in the brain in chorea minor, by Dr Jul. Elischer, Budapest (Plate III.). V. On the origin of so-called giant cells, and on tuberculosis in general, by Professor W. Brodowski, Warsaw (Plates IV. and V.). VI. The physiology and histology of the cornea, by Dr L. v. Thanhofer, Budapest (Plate VI.). VII. A case of diphtheria of a vaccination wound, &c., by Dr L. Letzerich (Plate VII, Figs. 1-4). VIII. On traumatic inflammation of the liver, by Al. Uwersky (Plate VII., Figs. 5-6). IX. On the treatment of aneurisus with the incomplete metal ligature *à fil perdu*, by Dr J. Minkiewicz, Tiflis. X. Pathological anatomy of the central nervous system. The *état criblé*, by Dr Rudolf Arndt, Greifswald. XI. Etiology and prognosis of intra- and extra-ocular sarcomata, by Dr M. Landsberg, Berlin. XII. Smaller communications. 1. On the medicinal action of iodide of potassium, by H. Kämmerer, Nürnberg. 2. A defence against H. Köhler, Halle, by Professor C. Binz, Bonn. 3. Medical and scientific obituary for 1874, by Dr W. Stricker, Frankfort. 4. Prize-essay of the German Sanitary Association.

I. Review of the Transfusion Question (*Panum*).—This author has felt called upon to return to the question of transfusion, because his former conclusions have been controverted. He published two articles on the subject in Vols. XXVII. and XXIX. of this Archiv, the effect of which seemed to be that the use of human defibrinated blood superseded the blood of other animals, especially that of the calf, lamb, &c., which had been recommended by Brown-Sequard. In 1873, however, Gesellius and Hasse have reasserted the advantages to be gained by the direct transfusion of the blood of certain animals. In the present article the author considers, first, the indications for the use of transfusion; and secondly, the method and kind of blood to be employed.

It has been proved by experiment that an animal cannot live without the supply of fresh nourishment by the alimentary canal. Blood transfused into the vessels does not take the place of food, and does not prevent an animal which is being starved from dying of inanition. The extra supply of blood corpuscles does not serve as nutriment, but seems rather to be deleterious, increasing the waste, apparently by using up an additional quantity of oxygen. Blood is to be regarded as a tissue which is used as the vehicle by which nourishment is carried to the other tissues, perhaps altering the constituents slightly in transit, but is not itself a source of nourishment. Neither is the fibrine used for purposes of nutrition. Even if it were, its quantity is so small that it would not be worth while transfusing blood in order that its fibrine might be so used. In a pound of normal blood, there is only about a gramme (15.4 grains) of fibrine. Fibrine is further of no essential service in carrying on the respiratory functions. Defibrinated venous blood is as capable of absorbing oxygen as that containing fibrine. In transfusing blood, therefore, we cannot expect to supply nourishment to the patient, we can only fill up any defect in the number of the blood corpuscles. The one indication for the use of transfusion is, therefore, deficiency of blood-corpuscles, and the deficiency can be as well supplied by defibrinated as by fibrinous blood. The blood corpuscles may be counted by the process described by Mela-sez. On the other hand, we cannot expect, by depletion and transfusion, to remove a deleterious substance which is being continuously produced in the organism, as in pyæmia, erysipelas, diphtheria. Again, in cholera the red corpuscles are relatively numerous, so it is of no use there. It is also useless in tetanus, melancholia, &c. The operation is further contra-indicated where there is great weakness of the nervous system, and especially of the nerves of the

heart, as there is some risk of paralysis of the heart during the operation.

Now, as to the method to be employed, it will be gathered from the above remarks that the author recommends the transfusion of defibrinated blood. Of late, immediate transfusion from the vessels of one animal to the other has been recommended. But this has three great disadvantages. In order to estimate the quantity introduced, it would be necessary to weigh the individual before and after the operation, and you would be in ignorance of the quantity during the operation, for it would be out of the question to interrupt the operation in order to weigh the patient. Then by this method you may introduce clots, and that may lead to serious results. And lastly, you cannot readily check the speed of the stream of blood, and too great speed may be dangerous to life. There is, however, no necessity to resort to this method. It has been proved, by experiment, that a dog which has been apparently bled to death may be resuscitated by the transfusion of defibrinated as well as by entire blood. The view of Magendie is therefore incorrect, that the presence of fibrine is of great importance for the passage of blood through the capillaries. Experiment shows that when defibrinated blood is transfused into the vessels of an animal of the same species, the corpuscles are actually transplanted, and survive in their new habitation. By using defibrinated blood you avoid the risk of embolism, which is considerable when entire blood is used. If transfusion is done with human blood it should always be defibrinated, and human blood should not be difficult to get, as not one person in a thousand suffers in the least from the loss of eight or ten ounces of blood. But if the blood of an animal will do equally well, then, perhaps, it should be preferred. The author, however, asserts, in contradiction to Gerellius and Hesse, that if the blood of a different species be used it acts like a poison. Experiment proves that if the blood of the lamb or calf be transfused into the vessels of a man or dog, the urine becomes bloody or black in colour, there are often considerable hæmorrhages, the patient complains of dulness, weariness, pain, and sleepiness. When death occurs, there is found to be bloody fluid in the serous cavities and tissues. The urine, although it appears bloody, does not contain blood corpuscles. There is sometimes suppression of urine. It will be seen, therefore, that the author is still strongly in favour of his former view, that defibrinated human blood should always be used when transfusion is required.

In a postscript he intimates that he has just seen Ponfick's paper (see this *Journal*, July 1875, p. 233), which in several points confirms the views stated above.

V. On Giant Cells and Tuberculosis (*Brodowski*).—Great importance has been lately attached to the existence of the so-called giant cells, chiefly in connection with tuberculosis. Schüppel and Langans have chiefly insisted on their very frequent occurrence in tubercles, and they regard tubercles as composed of a peculiar tissue, of which giant cells are an important constituent. As to the origin of these cells, the author considers that they are always related in their origin to the blood-vessels. He believes that where they occur there is great activity of the walls of the vessels, and that imperfectly formed buds from the vessels are converted into giant cells. As to tubercle, the view held by Lebert, that it is a form of inflammation, was gaining ground till recently, when it has been assailed by Schüppel, Langans, and Köster, who have asserted for it a peculiar tissue. Friedländer has discovered giant-cells in lupus and various ulcers, and described these as cases of local tuberculosis. The author, however, returns to the inflammatory view, and considers that tubercles are composed of a modification of granulation tissue, which, in place of blood-vessels like ordinary granulation tissue, contains imperfect germs of vessels in the form of giant-cells or networks. The peculiar round form of the tubercles he ascribes in some cases to their mode of origin from infection, and in others, to the anatomical condition—irregularity of dissemination, &c.

VI. The Physiology and Histology of the Cornea (*Thanhoffer*).—The results obtained are of great interest, but are too numerous and intricate for us to abstract them fully here. He shows that the channels by which fluid passes for the nutrition of the cornea are even more numerous than had been supposed, the nerves lying in pretty wide passages, which, as well as the stellate cavities described by Recklinghausen, are lined with endothelium. He finds that the nerves are connected with the stellate cornea corpuscles, that they form a plexus beneath the epithelium, and have an end-apparatus on the surface of the cornea. After puncture of the medulla oblongata he has seen fatty degeneration of the cornea corpuscles. He also states that in inflammation of the cornea he finds division of nuclei, and proliferation of the corpuscles, as well as emigration from without.

VII. Diphtheria and Vaccination (*Letzerich*).—This paper is suggested by a case in which, after vaccination, diphtheria developed, and the question arose whether the diphtheria had been communicated with the vaccine lymph. The vaccine pustule developed at first normally, but thirteen days after vaccination

the arm swelled round the spot, and the patient ultimately died with all the symptoms of diphtheria. The author endeavoured now to determine what would be the effect of inoculating an animal with vaccine lymph combined with diphtheritic material. He found that lymph so affected does not produce the ordinary vaccine pustule, but leads to a local, followed by a general, diphtheria. He concludes that in the case under discussion the diphtheria was not introduced in vaccination, else the pustule would not have developed as it did. The fact that the diphtheria occurred thirteen days after the vaccination also favours this conclusion, as he has never observed a period of incubation exceeding seven days.

X. The "etat criblé" of the Nerve Centres. (*Arndt*).—This condition in which the brain substance appears on section as if perforated with numerous apertures has been long known, and it is acknowledged that the apertures are related to the blood-vessels. There has been some dispute, however, as to the exact nature of this relation, and the present author gives here the results of his observation. It may be stated at the outset that the condition does not appear to be characteristic of any special form of disease. It is mostly met with in old persons, in drunkards, and in cases of paralysis of central origin, and in general paralysis, where it is pretty generally distributed throughout the brain substance. It is met with chiefly in the grey matter, but also occurs in the white substance. It has its principal seat in the cerebrum, but may be met with in the cord, the vessels, and cerebellum. It is usually localised in areas about the size of a walnut or over. In order to explain the results to which the author has arrived, it is necessary to refer to the lymph spaces which have been described in the brain. Two kinds of lymph channels are described as existing around the vessels. In one of them the space lies between the vessel proper and its external coat or adventitia, which is composed of a membrane formed of endothelial cells. This space the author names, from those who first described it, the Virchow-Robin space. Then there is the space between the adventitia and the brain substance, the so-called perivascular space, or His's space. It is to be remembered that there is no intimate connection between the vessels and the brain substance, that the former lie in gaps of the nervous substance, into which they have grown at a comparatively late period; and though in young healthy persons the vessels may completely fill out these gaps, and thus His's spaces may appear to be non-existent, yet there is always the possibility that they may be

come dilated. In addition to these channels around the vessels there are lymph spaces in the brain substance itself, as around ganglion cells and nerve fibres. These are most intimately related to the Virchow-Robin spaces, which indeed seem to be the essential channels for the lymphatic circulation. They lead to spaces and channels in the pia mater by which the fluid is evacuated, whereas the His's spaces end in the epicerebral and epispinal cavities, which are virtually *culs de sac*. The His's spaces are in fact reservoirs which normally appear to be closed, but under certain circumstances undergo dilatation. They get filled out when there is any obstruction to the passage of the fluid away by the Virchow-Robin spaces, such as occurs in congestions, where the vessels are dilated, or inflammations, where there is exudation into these spaces. The Virchow-Robin spaces may also be interfered with in atrophy or shrinking of the brain substance. When the fluid stagnates in the His's spaces, it soon undergoes changes. It loses its nutritious properties, and the brain substance suffers accordingly. But it may after prolonged stagnation undergo more palpable alterations, leading to colloid or fibrinous depositions.

STRICKER'S MEDIZINISCHE JAHRBÜCHER.

1875. PARTS 1 AND 2.

CONTENTS.—I. The significance of the function of the skin for the temperature of the body and the regulation of the temperature, by Dr W. Winternitz, Vienna. II. The anatomy of the Eustachian tube in man, by Dr V. Urbantschitsch, Vienna (Plates I. and II.). III. Studies on the changes occurring in the lungs after injuries to the brain, by Dr M. Heitler. IV. Four cases of congenital sacral tumour, by J. Lütkenmüller. V. On the fascia perinaei propria, by Dr E. Zuckerkandl (Plate III.). VI. Contribution on the static sense (organ of equilibrium, vestibular apparatus of the labyrinth of the ear), second paper, by Dr J. Breuer, Vienna (two woodcuts). VII. On abnormality and disease, by S. Stricker. VIII. On epileptic mental disturbances, by Professor M. Leidesdorf. IX. Contribution on the action of quinine, by Dr C. v. Schroff, Junr. X. Contribution on certain laws of heredity, by Dr H. Obersteiner, Vienna. XI. Further communication on the result of the resections in the Danish army during the war of 1864, by Dr A. Hannover, Copenhagen. XII. The histology of lupus (Willum), by Prof. E. Lang, Innsbruck (Plates IV. and V.). XIII. Certain congenital anomalies, by Dr S. H. Scheiber,

Bukarest (Plate VI.). XIV. A case of muscular bruit, by Dr M. Heitler.

I. The Regulation of the Temperature through the Skin (*Winternitz*).—From these observations there seems no doubt that the skin plays an important part in regulating the temperature of the body. The amount of heat given off by the skin can be calculated, and the author has devised an apparatus by which the amount can be estimated for the individual parts of the body. It seems that the amount given off is subject to very great variations, both in the upward and downward direction, and this is made use of in regulating the temperature of the body as a whole. For instance, after the withdrawal of a large quantity of heat from the body, there will be a great diminution of the amount given off by the skin, and this will last till the temperature is restored, perhaps without any increase in the actual production of heat; the retention of heat is thus capable of bringing about a state of equilibrium. Again, a temporary diminution in the loss of heat by the skin may explain a rapid febrile increase of temperature in many cases without supposing an increased production. Also the occasional rapid defervescence which we meet with, may be explained by the fact that the loss of heat in a given interval of time may be increased according to these experiments to the extent of 90 per cent.

III. Changes in the Lungs from Injuries to the Brain (*Heitler*).—This is a series of experimental observations. It appears that injury of the brain is generally followed by some affection of the lungs, which consists chiefly of hyperæmia and hæmorrhage. A comparison of the cases shows that while there are some parts of the brain, injury of which is followed by an affection of the lungs, still injury of the most diverse and widely removed parts of the brain leads to the same kind of changes in the lungs. Injuries of the medulla oblongata produce equally intense changes to those of the other parts of the brain.

IV. Congenital Sacral Tumours (*Lillemüller*).—The four cases of this very interesting form of tumour are fully described. The characters common to them all are chiefly these: They have their seat immediately behind the rectum, generally lying between sacrum, trochanter, and rectum. They do not appear to take origin from the vertebrae or pelvic bones, and tend to grow externally. The tumours are occasionally of considerable size as compared with that of the individual. They were all in female children, one of whom survived for fourteen

days, one was delivered by embryotomy, and the other two were immature. They all contained voluntary muscle, cysts with epithelial lining, and a system of tubes resembling gland-ducts, and also lined with epithelium. One of the cases was somewhat peculiar, chiefly in respect of the small size and firmness of the tumour. Its cysts were, however, relatively large, and some of them were dermoid, with hairs, sebaceous and sweat glands in their wall. This tumour also contained an unusual amount of fatty tissue and muscle, and the tissues as a whole were more highly developed than in the others. There are two different views taken as to the origin of these tumours. The one is that they are actual new formations, owing their origin to a foetal residue. According to the other, they are of the nature of a *foetus in situ*, and this is the view taken by the author, who gives his reasons for this opinion.

VIII. The Mental Disturbances of Epileptics (*Leidesdorf*).—This paper has been suggested by the trial of a servant girl in a town of Lower Austria. The girl, who was sixteen years of age, and had hitherto borne an irreproachable character, set fire to her master's barn, and was tried for it. She was epileptic, and was subject to peculiar sensations before the attacks. She was, according to her own account, subject to these peculiar sensations at the time when she committed the crime. The evidence of medical witnesses was resorted to, who gave it as their opinion that before the onset of epilepsy the patient is in a perfectly responsible condition. They stated that epileptics do indeed furnish a large constituent to asylums, but it is only cases which have existed for years. The prisoner was then sentenced to eight years' confinement. The author protests against this opinion of the medical witnesses, and objects to the severity of the sentence founded on it. It is true that in many cases there is no mental disturbance with epilepsy, about 40 per cent. of the cases seem to be free from mental affections. Several celebrated men have been subject to epileptic fits, as Mahomed, Petrarch, Newton, Peter the Great. But still there are innumerable facts to show that mental disturbance may either precede or follow, or occur in place of epileptic attacks. The author brings forward a number of cases which go entirely against the opinion of the medical witnesses. But again, epilepsy may exist for years without its existence being discovered, and mental disturbance may occur even as the result of epilepsy without the cause being suspected. Trousseau states that attacks may at first occur only at night, and go on without being noticed for eight or ten years. In these cases the

form of mental disturbance may suggest epilepsy, and lead to the discovery of its existence. It is noteworthy that events which accompany the mental disturbance of an epileptic attack, whether this be complete or incomplete, are often entirely forgotten, or very imperfectly remembered. The case is recorded by Trousseau of the president of a court who one day left the house, threaded his way through busy streets, and awoke to consciousness to find himself on one of the quays of Paris. [The present writer met with a case recently of a man who was working in a saddler's shop in Renfield Street. One day he found himself sitting in the middle of the day on one of the benches in George Square, and remembered nothing as to how he came there. His shopmates told him that he had put off his apron in the usual way, and walked out.] The author also records the case of a girl who, in her second attack, left her house in Linz, travelled to Vienna, where she came to a sister, who took her to the hospital. She only recovered consciousness two days afterwards, and wondered how she came to be where she was. The following passage from Trousseau's "Clinical Medicine" is quoted as bearing on such cases as that with which this paper begins:—"It may be said, almost without fear of making a mistake, that if a man suddenly commits murder, without any previous intellectual disturbance—without having up to that time shown any symptoms of insanity, and if not under the influence of passion, or of alcohol, or any other poisonous substance which acts with energy on the nervous system—it may be said, I repeat, that the man is afflicted with epilepsy, and that he has had a fit, or, more usually, an attack of vertigo." It is further stated, on the authority of Schroeder van der Kolk, that epilepsy leads more rapidly to mental disturbance when the fits are imperfect. Again, a patient may be for years free from attacks, and have a sudden maniacal fit, which seems to have come in the place of the epileptic attack. The author proposes to discuss the treatment of epilepsy in a future paper.

IX. The Action of Quinine on Blood-pressure (*Schroff*).—The administration of quinine was found to lower the blood-pressure in dogs and rabbits subjected to experiment. This is caused by diminished irritability of the vaso-motor centres in the medulla oblongata. It was found that not only was the pressure lowered, but even measures, which under normal circumstances raise the pressure, only succeeded to a slight extent after quinine had been administered, as, for instance, irritation of the sciatic nerve, or cessation of respiration. Some authors have asserted the existence of centres in the brain which

inhibit or restrain the vaso-motor centres of the medulla oblongata, and it might be supposed that the reduction of the blood-pressure may be due to an irritation of these centres, which would restrain the vaso-motor centres from acting on the vessels. But this is contradicted by the fact that the effect remains even after the medulla oblongata has been divided from the rest of the brain.

X. Heredity of Induced Epilepsy (*Obersteiner*).—

These observations are rather few to be conclusive, but so far as they go, they serve as indications or confirmations of certain laws of heredity. The author took advantage of Brown-Sequard's observations, that epilepsy could be artificially induced in guinea-pigs by cutting the spinal cord or the sciatic nerve. A few days after this operation it is found that a certain area on the head and neck of the same side as that operated on, have become less sensitive, but on pinching the skin in this area (which is called the epilepto-genetic zone), the body is bent to that side and the legs are convulsed; after a still longer period of days or weeks, pinching of this area causes complete epileptic convulsions. The tendency to the occurrence of these convulsions seems to diminish in the course of months, but, according to the author, it never entirely disappears. Another method of inducing epilepsy in guinea-pigs has been devised by Westphal; he gives the animal a succession of strokes on the head, and this, in many cases, is sufficient to render it epileptic. The author, in his observations, employed Brown-Sequard's method of cutting the sciatic nerve. He used three couples of guinea-pigs, in order to observe the effect on the young, under three different conditions. In one of the couples the male had been made epileptic, in another the female, and in the third both. He gives account of thirty-two young from these three couples, and tabulates the results. Of the young from the epileptic male and healthy female, eleven were healthy and six diseased. From the epileptic female and sound male, there were eleven diseased and two healthy. From the couple which were both epileptic, there were only two and both were diseased. It is to be remarked, however, that in only two cases were the young ones epileptic, the form of disease in the others being some other kind of nervous disease. Thus, eleven were so weak that they did not long survive their birth; three had incomplete paralysis of the hind legs: three were affected with a disease of the cornea, similar to that found after division of the fifth. It is noteworthy that this affection of the cornea occurred in the young of the couple in which the male was epileptic, and that these three had a black

mark on the nose which the father possessed, while eight young of the same brood were normal and had not this mark. These results give some confirmation of certain laws of heredity. They prove the inheritability of accidental disease, which indeed is supported by numerous other cases on record. Then they show that there is considerable variation and interchange in the inheritance of nervous diseases. They also seem to indicate that the mother's influence is greater than the father's in the inheritance of disease of this nature.

XII. Histology of Lupus (*Lang*).—The author describes and illustrates, by a plate, the histology of lupus, and thus sums up the results, "The disease of the skin called lupus is distinguished by a disturbance of nutrition, which leads to a continuous production and subsequent destruction of connective tissue, blood-vessels, and epithelium. According to the stage, will the productive or retrograde processes appear most prominent. But in every case it will be found that proliferation of cells (proceeding from the vessels) plays the chief part, and that even in the last stage there is not only absorption of the degenerated structures (both new-formed and pre-existing), but that there also occurs organisation of the cellular structures going on to the formation of connective tissue. By this means the lupous skin may take on a cicatricial appearance without previous ulceration.

XIII. Certain Congenital Malformations (*Scheiber*).—There are, 1. A case of partial duplex formation or division of the ascending colon, forming as it were an island between two pieces of gut (illustrated). 2. Acute curvature of the ascending colon (illustrated). 3. The cæcum and ascending colon attached to the left of the vertebrae. 4. Imperfect formation of a cloaca, the rectum opening into the vagina. There was also a uterus bicornis, and the right kidney was absent. 5. Two diverticula of the ileum. 6. Absence of the spleen which was supplied by an organ resembling a hypertrophied lymphatic gland. 7. Hypertrophy of the mammae in a man 45 years of age (illustrated).

XIV. A Case of Muscular Bruit (*Heitler*).—This occurred in a man who was admitted to the hospital in an unconscious state with active contraction of the muscles of the thorax and upper arm. A bruit was audible with the contractions of the biceps, but it had disappeared the morning after. The sound was not the least like the normal first sound of the heart, which some

authors have taken to be muscular in origin. The author states that if any one has observed a case of acute rheumatism, in which the first sound first disappears and is then replaced by a distinct murmur, he will not doubt that it has its origin in the valves, and not in the walls of the heart.

TRANSACTIONS OF The Medico-Chirurgical Society.

SESSION 1875-76.

FIRST MEETING, 3rd Sept., 1875.—Mr John Reid, Vice-President, in the chair.

The following gentlemen were elected office-bearers for the current session:—*President*—Dr James Morton. *Vice-Presidents*—Dr D. Richmond, Paisley; and Dr Robert Perry. *Council*—Dr R. Stewart, Coatbridge; Dr James Scanlan; Dr Alex. Patterson; Dr James Dunlop; Dr D. Taylor, Paisley; Mr A. Macfarlan; Dr Thomas Reid; Dr T. M'C. Anderson. *Secretaries*—Dr Joseph Coats and Dr Gavin P. Tennent. *Treasurer*—Dr Hugh Thomson.

The chair was then taken by Dr Perry, the new Vice-President.

Dr Fergus gave an address, containing

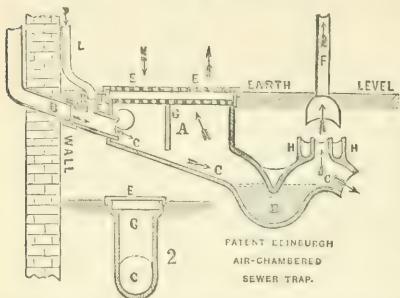
"SANITARY HINTS FOR DOMESTIC DRAINAGE,"

And illustrated his remarks by diagrams, specimens of improved sewer-traps, and corroded leaden pipes. With regard to the corroded soil pipes,* he began by drawing attention to the fact that the wasted parts were situated on the upper side, and that, on close examination, it would be found from those parts not entirely eaten through, that the destructive process was from within outwards. The small particles of crust on the inner surface, in the vicinity of the perforations, were composed of carbonate of lead. Taking into account the situation of the perforations, the direction of the agency producing them, and other circumstances, the inference appeared inevitable that they were caused by the action of sewer gas. This view was also borne out by the fact that ventilated pipes—in which the action of the gas was mitigated by dilution—lasted much longer than unventilated pipes. The causation of typhoid fever, diphtheria, diarrhoea, and scarlet fever by the presence in houses of sewer gas was now widely acknowledged in the profession. So firm was his own conviction of

* Specimens were exhibited to the Society in 1868, see this *Journal*, Vol. I., N.S., page 117. For plates of corroded soil pipes, see Vol. IV., N.S., p. 193.

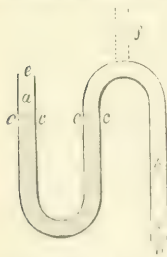
the connection between sewer gas and these maladies that the occurrence of a case in a house made him at once turn his attention to the state of the domestic drainage. In a case of typhoid fever in a house in which he was informed by the lady that the closet had been renewed only two months previously, he felt a perceptibly disagreeable smell. Sending for the plumber, he left word for him to look for a perforation, which would be found in the cross pipe, near the main soil pipe. The verification of the prediction very greatly astonished the plumber. The question now arose, in what way did sewer gas find admission into houses in cases in which the pipes were entire? It might get admission in one of three ways. The first method was by means of tension. They were all aware that if, from any cause there was great tension in a sewer, there would be for the time a failure of the trap. This, however, was only an occasional occurrence, and this cause might therefore be dismissed with merely mentioning it. The second way in which the sewer gas could find an entrance into the house was from the fact of its being generated in the trap on the house side. There was in nearly every case an accumulation of fecal matter on the house side of the trap, and they did not give the process of decomposition that went on there the weight to which it was entitled. This fecal matter could not escape until it was dissolved, in the process of dissolution partial decomposition taking place. The feces floated on the surface of the trap. The apparent remedy for such a state of matters was to flush the pipes, and he had accordingly tried the effect of a large volume of water, but to no purpose. The only result was that the fecal matter was sent whirling round and round, without escaping from the trap. The generation of gas was therefore a matter of necessity. The attempt to sweeten the pipes by pouring down disinfectants might be dismissed as absurd. It would be as futile as Dame Partington's endeavour to stop the progress of the Atlantic with a broom. What then could be done to remedy this state of matters? One method was to run the sewers, under proper precautions, in the open. He had done this with his own house drains, placing the trap near the main drain, and laying the house drains open for several feet at the back of the house, taking care to cover the opening with a wire cage, filled with seaweed charcoal, and covering the whole with a grating. Other good methods involved the principle of ventilating the sewers at least on the house side. The Somerset trap, which had an opening for the escape of gas, both in the house and the sewer side of the trap, was a very useful one. Potts' Edinburgh sewer trap (see annexed figure) accomplished the same purpose by having an air chamber between the house pipe and the sewer, in addition to a ventilating shaft and the ordinary water trap. Mr Buchanan's trap also effected the same object by allowing all the gas generated in the house side to escape into the open air. He had taken care not to commit himself to the advocacy of any particular scheme. What was wanted was to make as complete a severance as possible between the house and the sewer. The third way in which sewer gas could find a lodgment into the house was by

being absorbed on the sewer side of the trap, and given off on the house side of it, given off, too, be it remarked, before the point of saturation had been reached.



This, he thought, was the principal source of the supply of sewer gas in houses. Although decomposition of faecal matter on the house side of the trap was continually going on, he hardly thought that it could generate gas to such an extent as to destroy lead pipes. Taking this

view of the matter, he had looked around for another source of sewer gas, and remembering Graham's well-known experiments on the diffusion of gases, he thought it likely that the same process would go on through water. By general reasoning, then, he had arrived at the conclusion that the process of absorption and discharge of sewer gas must be going on in the trap, when his friend, Mr Scott proposed to put the matter to the test of experimental demonstration. This was done as follows:—A



bent tube, as in the annexed plate, was used; *a* representing house side of trap, *b* sewer side of trap, *ccc* level of water in trap, *d* small vessel or test tube from which the gas was evolved, *e* position of the test tube employed, *f* position of tube, subsequently added, to ventilate the trap. In first experiment a small glass tube was placed at *d*, containing solution of ammonia. In fifteen minutes it passed up the tube, through the water, and discharged the acid, which reddened litmus paper suspended at *e*. In another experiment, a bent tube, containing Nessler solution, was intro-

duced instead of litmus, and in half an hour the reaction of ammonia was distinctly perceptible. In the course of the night the wire suspending the tube was eaten through by the acid. An objection very properly taken to the employment of ammonia, on the ground of its being lighter than air, and having a strong affinity for water, was obviated by repeating the experiment with gases heavier than air, and always with the same result. Sulphurous acid, sulphuretted hydrogen, chlorine, and carbonic acid were in this way successively tried, and in each case the characteristic reaction occurred at the place analogous to the house soil pipe. Even the ventila-

tion of the trap by the pipe *f* did not alter the result, though the action was a little delayed. The demonstration that sewer gas was thus absorbed and discharged by the trap appeared therefore to be complete.

Few people, unless attention had been specially directed to the enquiry, had any idea of the increase, within the present generation, of the mortality from excremental pollution diseases. From the statistics of the Registrar-General it appeared that from 1838 to 1842 the mean annual rate of deaths from dysentery, diarrhoea, and cholera was 298 for each million of population; while for the five years, 1867 to 1871, the same mean annual rate was 1161. In neither of these periods was there any cholera epidemic. During the former of these quinquennial periods the total deaths from zymotic disease averaged 3770 annually, while during the latter period it averaged 4282. In the former period the total mortality from other causes averaged 18,308; during the latter period the mean was 18,059. In 1851 diphtheria first appeared in the English Registrar's tables, the number of deaths from it in that year being two, while in 1859 it had mounted up to 487 per million of population. These figures spoke for themselves.

Impressed strongly with these facts, he had at first advocated the keeping of fecal matter from the sewers altogether. But this was too radical a measure to hope for its speedy adoption, and he had therefore set himself to study how the defects of the existing system could be best remedied. He would therefore, for this purpose, throw out the following suggestions:—1. With regard to the situation of the water closet, there could be no doubt that the present arrangement was an ingenious contrivance for throwing the gas that might escape fully into the house. There was an arrangement for letting a current of fresh air into the closet, but none for the escape of any out of it, except into the house. This arrangement was simply the worst possible. The water closet should be out of the house, in a back projection, and in no circumstances should the current of air into the house be through the water closet. Where structural arrangements could not be made the water closet might be ventilated by carrying a pipe to the flue of the nearest chimney, if possible the kitchen chimney, in which the draft was more constant and more powerful. 2. No stream should be merely arched over, and thus used as a sewer. Organic matter would be sure to lodge in the crevices and there decompose. A regular sewer should be constructed, if it was necessary to follow the course of a stream. 3. Sewers should be laid on firm earth that would not yield. In loose earth Brook's patent might be used. 4. Care should be taken to guard sewers that passed through walls from the accident of the subsidence of the walls. This could easily be done by passing the drain under an archway. 5. The small pipes should open obliquely into the larger ones in the direction of current. 6. Lead should be discarded in the making of pipes, and earthenware or prepared iron substituted. 7. Great care should be taken in fixing the main pipe, and soil pipes should not be put in places out of view, but exposed to sight, so that defects in them

might be noticed. 8. A plan of the house drains should be delivered with the title deeds of the property, and a plan of the drains with the nature of subsoil of each town should be prepared and open to public inspection. 9. The whole arrangement regarding sewage, he might add, should be carefully supervised by properly qualified persons. The utmost care should be exercised in jointing the pipes.

With regard to the "ventilation" of sewers, he would *in limine* take exception to the term as a misnomer. Ventilation implied an arrangement for the escape of foul air and the substitution of fresh; but what was called the ventilation of sewers only provided for the former. It was, in fact, dilution, not ventilation. The process, however, was a very important sanitary measure. It had once been a cherished idea of his to connect the sewers with the fires of furnaces, but further reflection made him abandon the idea. No doubt an up-draught of air would be created, but the air would come from the rain water pipe or the street-gulley, and the plan would therefore be ineffective.

If he was correct in believing that cholera, diarrhoea, typhoid fever, diphtheria, &c., were diseases originated by the results of excremental pollution which found access to the system either by means of air or water; if these diseases were every year further swelling the death rate, he was safe in saying that the only real sanitary solution of the question was that all excremental matter should be within 24 hours returned to the earth, or subjected to chemical action, so as to render decomposition impossible.

If one-tenth of the talent, time, and skill, and one-thousandth part of the money expended in devising and executing the present artificial system had been applied to the working out of a system in harmony with the order and condition of nature, this sanitary problem would have been solved long ago.

Dr Hugh Thomson said that there could be no doubt that the present system of ventilating water closets was essentially vicious. Nothing better could be devised for bringing sewer gas into houses than a water-closet with a draught of air from the outside inwards. *Dr Fergus's* "hints" did not, of course, completely solve the problem of domestic sanitation, but they sufficiently indicated the direction in which a solution was to be looked for.

Mr John Reid said that he had always been sceptical in regard to the alleged effects of sewer gas in the production of enteric fever, diphtheria, cholera, and other diseases. He had many reasons for doubting this theory of the etiology of these affections, and he would only mention one or two. In the first place, typhoid fever was prevalent in this city before the introduction of the water-closet system. He was a native of Glasgow, and was old enough to remember the period when there were not above two or three water-closets in Glasgow. He had a distinct recollection of the existence of enteric fever as a disease of the people in Glasgow fifty years ago. Then again, he found, from the returns of the Registrar-General, that in 1844 the number of deaths in Glasgow from typhoid fever was 207, while at that time from all causes were 16,000. If the escape of sewer gas into

houses was attended with such dire results as Dr Fergus believed, how did he account for the relatively insignificant mortality from that fever which he believed to be directly caused by the gas? He very well remembered that in his 12½ years of country practice—in a district where water-closets and sewers and sewer gases were unknown—he had seen more of typhoid fever than in his long course of city practice. Dr Fergus's position was also disproved by looking closely at the monthly returns of the Registrar-General. In the month of March, 1874, there were 21 deaths from typhoid, while in June—a month in which it would be expected that the gas would be most noxious—the number had gone down to 9, only to mount up in November, when the colder weather had set in, to 23. Then again, in the latter month, the deaths in the Bridgeton district, in which there were fewest water-closets, exceeded those in the Blythswood district, in which they were universal. In the Clyde district, in which, on the theory they were considering, there should be the greatest havoc made, there were no deaths in November 1874. How could these anomalies be explained in the theory before them? In 1871 he found hooping-cough—which he presumed Dr Fergus would not ascribe to sewerage—a very prevalent disease, more fatal than typhoid fever, while there were two cases of fatal diphtheria. With regard to the latter disease, he was astonished at Dr Fergus's statement that it was not tabulated as a cause of death till 1851. He had seen genuine diphtheria in the winter of 1834-35, soon after the publication of Britonmeau's memoir. With regard to the erosion of the pipes he had spoken to plumbers on the point, and they affirmed that the holes were usually in the lower side of the pipe, and they attributed them to the action of lime, small pieces of which had got access to the pipes.

Dr Richmond, Paisley, said many of Mr Reid's strictures would have been justifiable and valid had Dr Fergus taken up the absurd and untenable position that all zymotic diseases were caused by water-closets. But Dr Fergus had only assumed this as one of many causes. Wherever there was filth and dirt, there they would have exhalations from them and zymotic disease in abundance. But the anomalous thing was that these diseases were generated not only in the squalid habitations of the very poor, but in the suburban villa of the rich, where everything that architectural skill could do had been done for the comfort of the inmates. In these houses they saw typhoid fever, diphtheria, &c., arise, and the question was forced on them how, with such apparently salubrious surroundings, did these diseases originate in such circumstances? Most of the ordinary sources of infection were absent, but one remained—the water-closet in the house. Dr Fergus and many others were now taking up the position in regard to the water-closet, that prevention was better than cure; that the mere tinkering measures hitherto adopted were inefficient, and that in order to exclude sewer gas from the house, the water-closet must be kept out of it. He entirely deprecated gigantic schemes of water-carriage for sewage, such as that of Messrs. Bateman & Bazelgette, which would perpetuate a vast sanitary error. He was glad to find that Dr Fergus confined himself to principles, and did not homologate any particular scheme.

Mr H. E. Clark reminded Mr Reid that in the Registrar-General's reports the number of cases of deaths from enteric fever in the Bridgeton district was disproportionately large, from the fact that Polyclinic fever hospital was situated in the district. No argument, therefore, founded on these figures in the Bridgeton district had any validity. With regard to the general question of water-carriage, it was interesting to note what other people were doing in the matter. The Liverpool authorities had at length

gone in entirely for the water-closet system, and since the adoption of the system, the health of the city had decidedly improved. The improvement might not, indeed, be due to the water-closets, as coincident with the introduction of the system, there would no doubt be other sanitary changes. Another point he would notice. In Liverpool they ventilated the sewers. This was done by means of special ventilating pipes furnished with screw pumps which were kept constantly in motion by the air. This of course was open to the objection stated by Dr Fergus, that the up-draught of air so excited would not affect the house sewers, but would draw from the main drain and street gullies. In Glasgow the sewers were ventilated into the open street by means of fenestrated man-traps.

Dr Wood Smith agreed with Dr Fergus in his main argument, and thought that his "hints" were of great value. With regard to the erosion of lead pipes, he had with him a pipe in which this destructive process had taken place in the upper side. This pipe was a part of his own house drainage, which, at the suggestion of Dr Peter Stewart, he had got entirely relaid on a plan which embodied most of the suggestions of Dr Fergus. Dr Smith then described in detail the plan on which his house was now drained. It was no doubt true, he continued, that, as Dr Fergus had said, the faeces in the cesspool after flashing remained on the surface, but if, as he had personally done, they stirred the liquid for some time—not a pleasant process he admitted—it would shortly be found to be perfectly sweet.

Dr McVail said that he had had a good deal of experience in the hospital of one of the most perfectly sewered of English towns, viz., Alnwick. The town was partly built on high ground, and he found that in regard to typhoid fever there were four or five cases from the higher part of the town for every one from the lower part—which latter was also the most densely populated. It was from the new houses in the streets on the top of the hill that the greater proportion of cases came. There was one very steep street, one side of which was much lower than the other, and he took note that it was from the higher side that the cases chiefly came. This fact appeared to corroborate the gaseous origin of the fever. With regard to Glasgow, they had sufficient explanation, quite apart from the water closet, of the manner in which sewer gas could enter the houses. Why, the sink in the kitchen of every working man's house in the city was connected with the sewer pipes! To keep out the gas therefore, even a more thorough reform than merely isolating the water closets would be necessary. The question of the utilization of sewage matter was scarcely included in the subject under discussion, but he might mention that an attempt had been made to utilize it in Alnwick, but without success. Even when unmixed with the drain water, the dilution was found to be too great to permit of its being applied as a profitable manure, and the farmer eventually declined to make use of it.

Dr P. Stewart said that his experience entirely agreed with that of Dr Fergus in regard to the deleterious effects of sewer gas. He thought that that gentleman, in the advocacy of his views when they were very unpopular—often in the face of opposition from the profession, and in spite of the opposition of house proprietors and plumbers—had shown a great deal of moral courage. Dr Stewart said he had seen a great deal of cholera in the epidemics of 1847 and 1851, and had generally been able to find, coincident with the occurrence of a case, the existence of some serious flaw or defect in the house drainage, either in the main line of the house or in the condition of the subsidiary drainage. He had found the state of the subsidiary

drainage much worse in the suburbs than in the city. In the late epidemic at Crosshill he had seen 22 cases of typhoid fever, and in every one of them he had found a faulty condition of some of the drainage pipes, such as to permit or necessitate the entrance of sewer gas into the houses. It had been said, indeed, that this faulty state of the pipes was no new thing; why then was there not an outbreak of fever before? The reply was that faulty drainage allowing the escape of sewer gas was only one of the factors that conduced to the origin of the disease. Coincident with this there was no doubt some peculiar atmospheric conditions, of the nature of which they were not acquainted, necessary to originate the disease. But even in the absence of any positive disease, he did not believe that the presence of these gases was by any means innocuous. On the contrary they lowered the vitality of the inmates, especially of the children in the house, so that when any disease attacked them they were very liable to succumb.

Dr Roufrew said that last winter he had a whole family suffering from the effects of the air in the house being contaminated by sewage gas. But it was quite a mistake to argue, as Mr Reid appeared to do, that sewer gas could come only from the water-closet. It could come from the sink in the kitchen, from the lavatory in the bed-room, indeed from decomposing organic matter whether in the sewage pipes or out of them. Typhoid fever was characteristically a disease of the rich, while typhus was the fever of the poor, or rather of the overcrowded poor. Typhoid fever was a penalty which they must pay for their water-closets, and it was a very serious set-off against their undoubted convenience. He coincided with Dr Stewart in regard to the effects of sewage contamination on the lowering of the health apart from the originating of active disease.

Dr Scott Orr said that there was one source of sewage pollution which Dr Fergus had not alluded to—viz., that from drinking water, which he considered of importance. The custom of having the cistern above the water-closet rendered it liable to this source of contamination. All drinking water should be had direct from the main. It was a remarkable fact that in the present generation typhoid fever had very much taken the place of what typhus fever occupied formerly. He quite demurred to the remark of Mr Reid that typhoid fever was equally prevalent before the introduction of the water-closet system. He (Dr Orr) remembered the time when typhoid fever was scarcely known at all. He was certain that if hospital records were searched, the statement would be found to be correct. Typhoid fever, as a prevalent disease, was essentially a modern thing. He might anticipate the objection that the two fevers were not discriminated at that time, by stating that in Glasgow the diagnosis between them was quite made out, and taught 25 or 30 years ago. This fact of one type of fever to a great extent superseding another was one that had not been sufficiently noticed; but it appeared to confirm Dr Fergus's theory.

Dr Perry said that the fact of sewer gas being capable of being absorbed in water, coupled with the other fact that the gas was given off from the solution before the point of saturation was reached, made drinking water in houses a possible source of contamination. It was well enough known that water was often polluted with sewage matter by percolation through the soil, and he had clearly traced an outbreak of typhoid fever at Garm-kirk several years ago to this source. In laying pipes down he held that there should be skilled superintendence, as plumbers, as a rule, had no

knowledge of the scientific principles involved. He thought that the prevention of decomposition was the great matter, and it was in this direction that the sanitary authorities should chiefly work.

Dr Fergus, in reply, said that he had specially guarded himself against any such misconception as that on which Mr Reid's principal criticisms were based, by stating that the excrementitious infection could operate *either by air or water*. He was only too well aware of the fact that it was not alone through water-closets that the mischief was effected. Some time ago he had been induced to have the 28 wells of a favourite watering place examined, and on submitting specimens of the wells to test, it was found that only one—in the extreme limit of the district—was free from organic contamination. Sewer gas also could find an entrance to the house through other channels than the water-closet. If the sink communicated with the sewer that was a means of admission, and frequently a bed was situated only a short distance from the sinks. The fixed basins in bed-rooms supplied another aperture. Mr Reid had asked how typhoid fever was produced before the introduction of water closets. Why, were they not then drinking the Clyde water, polluted, as it doubtless was, by the matter poured into it from Hamilton and the other towns above Glasgow! Mr Reid had made light of some 207 deaths from typhoid fever. But these 207 annual deaths represented some 1400 cases, and the amount of suffering entailed by these cases was by no means so insignificant. Besides, the point was: these deaths were from *preventible causes*, and if the making of two blades of grass grow where one grew before was a public benefit, it would surely be not less so to keep alive 207 people who at present died under bad sanitary conditions. He believed that by the greater part of the profession the production of typhoid fever by sewer gas was now an admitted fact. The late Sir James Simpson pointed out to him in Leith a row of houses in which the disease had been formerly unknown, but the dwellers in which had been decimated by fever after the introduction of sinks. With respect to perforation of the pipes, he had himself been of opinion that it was due to bits of lime, but he had satisfied himself beyond all doubt that this was not the cause. When he was examined by the River Pollution Commission, and showed some specimens of these pipes, the chemist to the Commission made the remark that the perforations must have arisen from some cause peculiar to Glasgow. But it was easy to prove that this was not the case. He had received specimens from other towns, and one of the very worst specimens was from London. That typhoid fever had very much increased of late years, almost every medical man will admit. And yet in our early days the people were presumably more fit subjects for it. They were worse fed, worse clothed, worse lodged than now. If all other sanitary conditions were now much advanced, and this water-closet system the only sanitary factor which was wanting, in former times, was not the inference fair that to it especially must we attribute the increase in that disease? With regard to the case of Liverpool, it was too early to form a judgment regarding the introduction of water-closets there. Whenever a drainage scheme was carried out, there was always, as an immediate result, an improvement in the health of the community. Everything was new, and the vice of a faulty system was not apparent at first. But let them wait till the full effects had time to develop themselves, when the system became water-tight, and the true value of the scheme could be estimated. Respecting the pollution of water in certain city water-closets, he had been at considerable trouble to ascertain whether the proximity of the closet was objectionable to the water, but in no case had he detected any organic impurities of the water. At the same time he agreed with Dr Orr that was not

a proper place in which to have a cistern. With regard to the supplanting of typhus with typhoid fever, it must be remembered that they were now, and had been for years, living in exceptionally prosperous times. But let there come a period of general bad trade, and it needed no prophet to foretell that there would ensue a crisis which would tax to the utmost all the existing sanitary machinery. The crowding into the city of such vast numbers of miserable Celts would yet tell disastrously in the future. When a district surgeon, he had seen in No. 16 Broomielaw, from one case of typhus fever, no less than 40 cases take their origin. It was therefore too early yet to say that typhus fever was supplanted. Dr Fergus concluded by thanking the society for the way in which they had received his suggestions.

Medical Intelligence, &c.

RESECTION OF THE STERNUM AND RIBS.—*Professor Costanzo Mazzoni* gives, in the *Anno Secondo di Clinica Chirurgica*, a detailed account of five cases in which the operation of resection of these parts was performed. The first case was that of a peasant, aged 55, who was suffering from a tumour situated at the middle of the sternum; this was hard and painful, had existed for about a year, and had latterly grown so rapidly that it measured 40 centimetres (15½ inches) in circumference and 23 (9 inches) in height. The tumour was fixed and adherent to the bone, and presented fluctuant points here and there; the skin over it was normal. Mazzoni excised the sternum from the manubrium to the xiphoid cartilage, together with a part of the second, third, and fourth costal cartilages, laying bare the anterior mediastinum and the pericardium. The heart could thus be seen beating. The dressing consisted in the application of lint steeped in carbolic oil, and in a solution of permanganate of potash. Slight diarrhoea set in, but was easily overcome. The wound looked well, and was covered with granulations, but, 15 days after the operation, hypostatic pneumonia carried off the patient. The other cases of resection were more fortunate, all the patients recovering. They were cases of caries of a part of the sternum, and of certain ribs in scrofulous individuals. The ablation of the carious bone saved the patients.—*Bulletin Général de Thérapeutique*, July 15th, 1875.

TREATMENT OF INTERNAL INTESTINAL OBSTRUCTION BY ELECTRICITY.—Basing his remarks on a certain number of observations, and more especially on a case under his own care at the Hospital of Brest, *Dr Fleuriot* advises the employment of electricity to overcome internal strangulations; he used a Gaiffe's battery, and placed one of the rheopores at the anus or in the rectum, and the other on the abdomen.—*Thèse de Paris*, Jan. 1875, and *Bulletin Général de Thérapeutique*, 15th July.

BLACK COLOURATION OF THE TONGUE.—*M. Féréol* has under observation a man who presents a black colouration of the tongue similar to what has been described by MM. Gubler and Raynaud. In this case the black spot is situated in front of the lingual V, and forms a raised patch more or less thick. *M. Féréol* has not found any trace of the fungus which *M. Raynaud* discovered, and which he compared to the *Trycophyton*. The microscopic examination showed only epithelial products, and hence *M. Féréol* proposes for this affection the name of "*piliform epithelial hypertrophy of the lingual mucous membrane.*"—*Bulletin Generale de Therapeutique*, July 15.

PHYSIOLOGICAL AND THERAPEUTIC PROPERTIES OF NITRITE OF AMYL.—*M. Bourneville* has experimented with this substance on cats and rabbits, and has obtained the following results:—The rabbits to which the drug was administered showed a very marked diminution of the pulse rate, injection of the conjunctiva, cyanosis of the tongue, a considerable dilatation of the vessels of the pinna of the ear, and a lowering of the cardiac energy. With larger doses, general cyanosis took place, and arrest of the heart's action. The temperature was invariably lowered, the reduction sometimes amounting to 2° C. It has long been known that nitrite of amyl produces a dilatation of the superficial vessels of the head, but there is still some doubt if a corresponding enlargement of those of the brain takes place. *M. Bourneville* has, however by the removal of a portion of the skull of a rabbit when under the influence of the drug, been able to ascertain that the vessels of the meninges are in a condition of dilatation. As regards its action in the human subject, and especially in epileptic patients, *M. Bourneville's* experience is not very favourable. He finds, indeed, that it is powerful in arresting an attack of epilepsy after the access of an aura, but he believes it to be powerless against the disease itself, and has not been able to confirm the favourable opinion expressed by Dr Crichton Browne in this respect. In cases of hystero-epilepsy, the patients have much benefited by its use, in so far as it prevented the occurrence of threatened convulsive attacks, but here also no permanent amelioration has been obtained. In these cases, also, he has noticed, after its inhalation, certain unpleasant consequences, such as the production of cyanosis, followed by pallor, hallucinations of sight, amblyopia, by head-ache, giddiness and loss of appetite. The dose which he has administered varied from 7 to 20 drops, and in one case 60 drops were inhaled without other ill effect than the production of pallor, vertigo, and head-ache which lasted for some hours.—*Journal de Therapeutique*, July 10th, 1875.

OPIUM POISONING TREATED BY ATROPINE.—*Gopaul Chunder Roy* contributes to the *Indian Medical Gazette* for July an interesting account of two cases of opium poisoning treated successfully by the hypodermic injection of solution of atropine. The first case was that of a boy, aged 11, who had swallowed about 40 grains of the drug; emetics were freely ad-

ministered, and the stomach pump was used, but the matters thus brought away had no distinct opium smell. The patient was very drowsy, and the pupil was contracted to the size of a pin's head. One-sixteenth of a grain of atropine was injected subcutaneously, and after half-an-hour (as no marked improvement was observed) the dose was repeated. Fifteen minutes after the second dose slight dilatation of the pupil was observed, but the other symptoms remained the same. A third dose was administered at the end of the second half-hour, and caused very marked dilatation of the pupil, so that it soon regained its normal size. The patient was very weak and exhausted, but in the course of a few hours was all right. The second patient was a child of $2\frac{1}{2}$ years of age who, it was supposed, had taken about 10 grains of opium. In this case a solution containing 1-100th of a grain of atropine was administered by the mouth, but with little or no effect. The hypodermic method was then resorted to, and after two doses the patient was well enough to be sent home.

[We think that there must be some mistake in the statement of the dose administered. It is printed thus, " $\frac{1}{10}$ grain," and it is not unlikely that $\frac{1}{100}$ is intended; this latter being a fair dose for hypodermic injection.—ED. G. M. J.]

ESSERINE IN CHOREA.—Dr E. Bouchut contributes to the *Bulletin General de Therapeutique* for April 15 a highly interesting paper, in which he details the results of his observations as to the effects of esserine (the active principle of *Physostigma venenosum*) on the human subject. His experiments, numbering 437, were made upon children affected with chorea, inmates of his wards in the *Hopital des Enfants Malades*, the drug being administered by subcutaneous injection in most of the cases, but a few of them being treated with pilules containing esserine or its sulphate, or with an aqueous solution of these pilules. He thus sums up the conclusions at which he has arrived:—"As the result of 437 observations on the action of esserine in moderate doses on children, we find that it diminishes the contractility of the muscles and increases the contractility of the small vessels. Esserine or its sulphate may be injected subcutaneously in doses of from 3 to 5 milligrammes ($\cdot 04$ to $\cdot 07$ grains), but, in consequence of the symptoms produced, I have not thought it right to exceed the latter number. The action of the drug lasts from two to three hours, and is then completely exhausted, so that the dose may be renewed in such a way as to administer from 15 to 20 milligrammes ($\cdot 2$ to $\cdot 3$ grains) in the day. The effects in these doses are constant, and consist of pallor of the surface, diminution of the fulness and often of the rate of the pulse, malaise, clamorous cries, epigastric uneasiness, with gastralgia, nausea, with expectoration of clear, stringy matter. Sometimes there is bilious vomiting, but in doses such as these there is neither constipation nor diarrhoea. Paralysis or even temporary paralysis of the diaphragm was the most serious and painful phenomena which we observed after the employment of 5 milligrammes

injected hypodermically. Given internally it had no effect on the pupil; and when administered in the doses mentioned no trace of it was found in the urine. Administered as a remedy for chorea (dance of St Guy), esserine arrests the movements during the continuance of its action, and little by little moderates them in the interval so as to cure the disease in a period of time which I estimate at about ten days. The effects of this agent in cases of chorea are more certain by means of subcutaneous injection than by administration by the stomach."

THE INTERNATIONAL CONGRESS OF OPHTHALMOLOGY will meet in New York on Tuesday, September 12th, 1876, at 12 o'clock noon. The following extracts from the rules of the Congress will give an idea of the general character of the Society, and of the terms of membership—

"1. The object of the International Periodic Congress of Ophthalmology is to promote Ophthalmological Science, and to serve as a centre to those who cultivate it. It will entertain no discussion foreign to this object.

"2. The number of members is unlimited.

"3. Every member must be either a Doctor of Medicine, or of Surgery, or of Science, or possess some other equivalent degree, or be distinguished for his scientific knowledge.

"4. Candidates for admission into the Society shall be admitted on presentation of their diploma, or of their scientific title, unless ten members demand a ballot.

"5. The sessions of the Society shall take place every fourth year, and be limited to ten days.

"11. The Society gives no diploma. Before the opening of each session a card, available for admission to all the meetings, and signed by the President and Secretary, shall be given to each member on payment of his subscription (fixed at 2 dols.), and upon signature of his name on the register of those attending the meeting."

The Committee are making all efforts to secure a large attendance, and one that will leave its mark upon the progress of scientific ophthalmology. The co-operation of the profession of Great Britain in securing these objects is earnestly desired by the undersigned, the Provisional Committee appointed in London in 1872 :—

CORNELIUS R. AGNEW, M.D.

HENRY D. NOYES, M.D.

DANIEL B. ST JOHN ROOSA, M.D.

BOOKS, PAMPHLETS, ETC., RECEIVED.

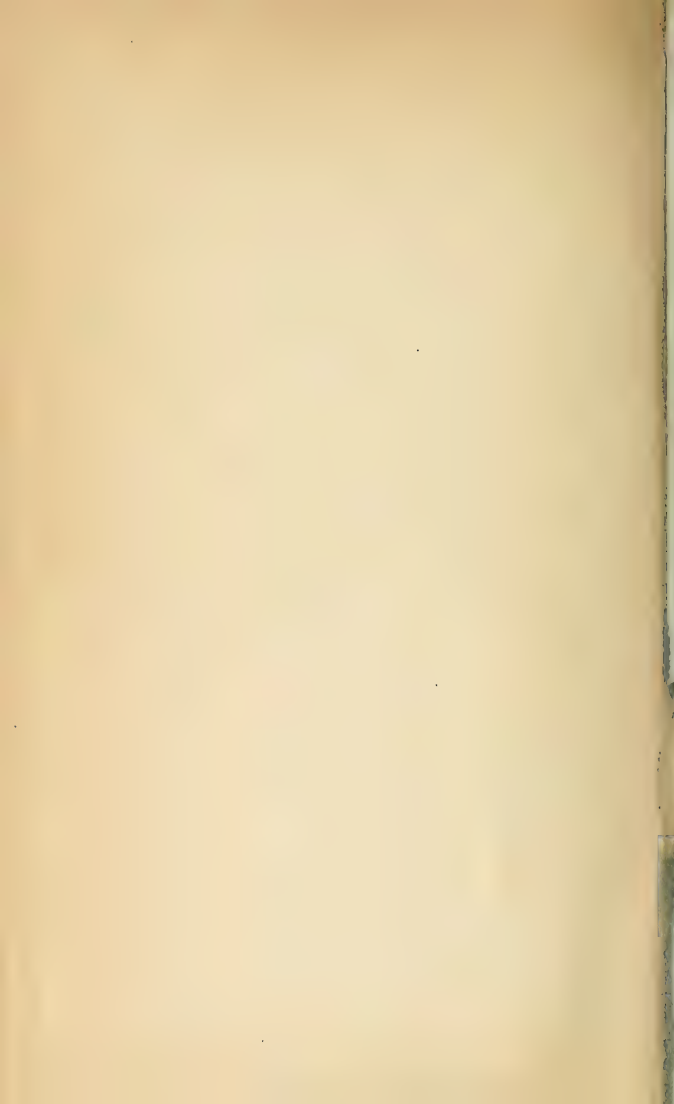
- Diseases of the Kidney, and Urinary Derangements. By W. Howship Dickinson, M.D., Cantab., Physician to and Lecturer on Pathology at St George's Hospital, &c. In Three Parts. Part I. Diabetes. London : Longmans, Green & Co. 1875.
- On the Immediate Results of the Operations of Glasgow Improvement Trust at last May Term, as regards the Inhabitants Displaced, with remarks on the question of preventing the recurrence of the evils which the Trust seeks to remedy. By J. B. Russell, M.D., Medical Officer of Health, Glasgow. Glasgow : Bell & Bain. 1875.
- A Commentary on the British Pharmacopœa. By Walter G. Smith, M.D., Dublin, F.R.C.P.I., Assistant-Physician to the Adelaide Hospital. London : Smith, Elder & Co. 1875.
- The Retrospect of Medicine. Edited by W. Braithwaite, M.D., and James Braithwaite, M.D., London. Vol. lxx., July-December 1874. London : Simpkin, Marshall & Co. 1874.
- Consumption and Tuberculosis, their Proximate Cause and Specific Treatment by the Hypophosphites, on the principles of Stœchiological Medicine. By John Francis Churchill, M.D., Paris. London : Longmans, Green & Co. 1875.
- The Toner Lectures. Lecture iii. On Strain and Over-Action of the Heart. By J. M. Da Costa, M.D., Professor of Practice of Medicine in Jefferson Medical College, Philadelphia, &c. Washington : Smithsonian Institution. August, 1874.
- A Practical Treatise on the Diseases of the Eye. By Haynes Walton, F.R.C.S., Surgeon to St Mary's Hospital, Paddington, Surgeon in charge of the Ophthalmic Department of the same, Lecturer on Ophthalmology, &c. Third Edition. London : J. & A. Churchill. 1875.
- Clinical Lectures on Diseases peculiar to Women. By Lombe Atthill, M.D., University, Dublin. Third Edition, Revised and Enlarged. Dublin : Fannin & Co. 1875.
- St George's Hospital Reports. Edited by John W. Ogle, M.D., F.R.C.P., and Timothy Holmes, F.R.C.S. Vol. vii. 1872-4. London : J. & A. Churchill. 1875.
- On the Treatment of Secondary Syphilis. By J. L. Milton. Reprinted from the *Edinburgh Medical Journal*, March, 1875. Edinburgh : Oliver & Boyd. 1875.
- Facts about Breadstuffs. Illustrated. With extracts from the best authorities. By B. Glasgow : Porteous Brothers. 1875.

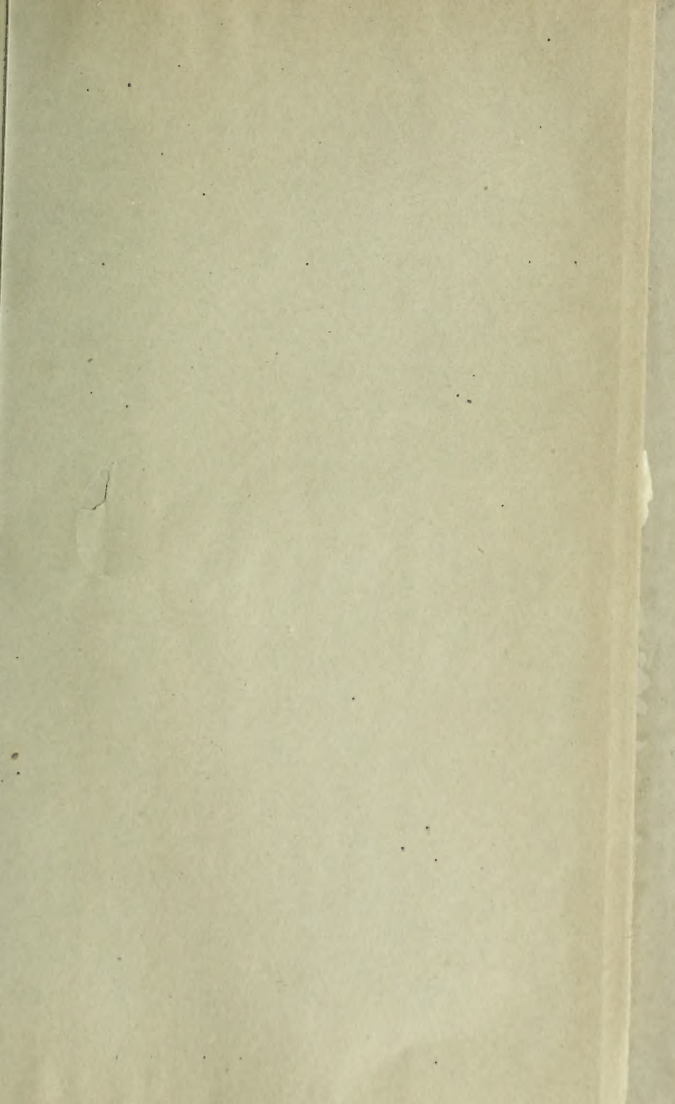
- Transactions of the Obstetrical Society of London. Vol. xvi. for the year 1874. London: Longmans, Green & Co. 1875.
- Recherches sur l'état de la pupille pendant l'anesthésie Chloroformique, l'asphyrie et sur certains effets de l'apomorphine. Par MM. Budin et Coyne. Paris, 1875.
- Recherches Cliniques et Experimentales sur l'état de la pupille pendant l'anesthésie Chirurgicale produite par le Chloroforme. Par MM. Budin et Coyne. Reprinted from Brown-Séquard's Archiv. Paris, 1875.
- Contributions to the Mechanism of Natural and Morbid Parturition, including that of Placenta Previa. By J. Matthews Duncan, President of the Obstetrical Society. Edinburgh: Adam & Charles Black. 1875.
- Clinical Lectures and Essays. By Sir James Paget, Bart. Edited by Howard Marsh, F.R.C.S. London: Longmans, Green & Co. 1875.
- Typhoid Fever; its Cause and Prevention. Illustrated by the Recent Epidemics in Crosshill and Eaglesham. By Eben. Duncan, M.D. Glasgow: James Maclehose. 1875.
- The Toner Lectures. Lecture iv. A Study of the Nature and Mechanism of Fever. By Horatio C. Wood, M.D. Washington: Smithsonian Institution. February, 1875.
- Modern Spiritualism; as read by the light of Physiology and Psychology. A Lecture delivered before the Greenock Philosophical Society. By W. J. Marshall, M.D. Greenock, 1875.
- Wildungen; its Baths and Mineral Springs. By Dr A. Stöcker. Translated from the German by Charles Harrer, M.D. London: Trübner & Co. 1875.
- Key to Skin Diseases. By Tilbury Fox, M.D. Henry Reushaw. London, 1875.
- Report on the Sanitary Condition of Birkenhead and Claughton-cum-Grange for the Year 1874. By Francis Vacher, Medical Officer of Health for the District.
- Report of a Case of Inversio-Uteri of Two Years' Standing, Reduced by Taxis, By F. Dawson, M.D. New York: D. Appleton & Company. 1875.
- Suggestions as to the Medicinal Treatment of the Unborn Child. By J. Thorburn, M.D. Manchester, 1875.
- Jahresbericht der Allgemeine Poliklinik in Wien für 1874. Wien, 1875.
- On Paralysis from Brain Disease in its common forms. By H. Charlton Bastian, M.A., M.D., F.R.S. With Illustrations. London: Macmillan & Co. 1875.

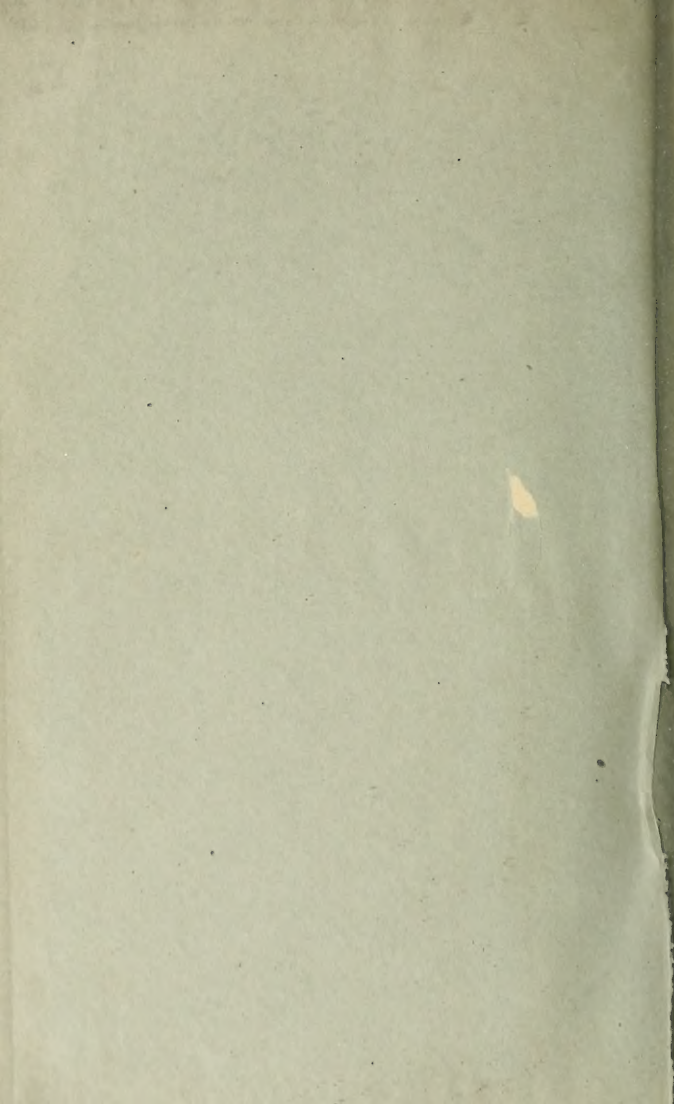
- Injections of Tincture of Iodine into the Cavity of the Uterus in Hemorrhage after Delivery. By James D. Trask, M.D. New York: William Wood & Co. 1875.
- New Inventions in Surgical Mechanisms. By Richard Davy, F.R.C.S. London: Smith, Elder & Co. 1875.
- Analysis of One Thousand Cases of Skin Disease, with cases and remarks on Treatment. By L. Duncan Bulkley, M.D. Louisville. 1875.
- Des Propriétés Physiologiques de Bromure de Camphre, et des ses Usages Thérapeutiques. Par Louis Pathault. Paris: Adrien Delahaye. 1875.
- The Skull and Brain: their Indications of Character and Anatomical Relations. By Nicholas Morgau. London: Longmans, Green & Co.
- Notes on the Treatment of Skin Diseases. By Robert Liveing, A.M., M.D., Cantab. Third Edition. London: Longmans, Green & Co. 1875.
- The Surgeon's Pocket-Book: being an Essay on the Best Treatment of Wounded in War, for which a Prize was awarded by Her Majesty the Queen of Prussia and Empress of Germany, in the year 1874. Specially adapted for the Public Medical Services. By Surgeon-Major J. H. Porter, late 97th Regiment; Assistant-Professor of Military Surgery, Army Medical School, Netley. London: Charles Griffin & Co. 1875.
- Lessons on Prescriptions and the Art of Prescribing. By W. Handsel Griffiths, Ph.D., L.R.C.P.E., Professor of Chemistry in the Ledwich School of Medicine, Dublin. London: Macmillan & Co. 1875.
- The Retrospect of Medicine. Edited by W. Braithwaite, M.D., and James Braithwaite, M.D., London. Vol. lxxi., January-June 1875. London: Simpkin, Marshall & Co. 1875.
- A Report on the Hygiene of the United States Army, with Descriptions of Military Posts. War Department, Surgeon-General's Office, Washington, May 1, 1875.
- The Veterinary Journal and Annals of Comparative Pathology. Edited by George Fleming, F.R.C.S. London: Baillière, Tindall & Cox.
- The Thirteenth Annual Report of the Peking Hospital for 1874. By John Dudgeon, M.D., C.M., Shanghai. 1875.
- Longevity of Flax Mill and Factory Operatives: length of time they are liable to work under present arrangements, with such suggestions as will render them more useful to their employers and their own families. By C. D. Purdon, M.B., F.R.C.S.E., Certifying Surgeon for the Belfast District. Belfast: H. Adair. 1875.

- The Successful Treatment of Internal Aneurism by Consolidation of the Contents of the Sac. By Jolliffe Tufnell, F.R.C.S.I. Second Edition. London: J. & A. Churchill. 1875.
- On Concussion of the Spine, Nervous Shock, and other obscure injuries of the Nervous System in their Clinical and Medico-Legal Aspects. By John Eric Erichsen, Professor of Clinical Surgery at University College, &c. London: Longmans, Green & Co. 1875.
- On the Relation between Diabetes and Food, and its Application to the Treatment of Disease. By Arthur Scott Donkin, M.D. London: Smith, Elder & Co.









SERIAL

R
31
G5
v.7

Glasgow medical journal

GERSTS

